HOSPITAL PROGRESS

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His Excellency, Archbishop Glennon

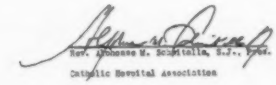
WITH hearts full of affectionate admiration, gratitude to God, and loving respect, the Catholic Hospital Association of the United States and Canada congratulates His Excellency, the Most Reverend John Joseph Glennon, Archbishop of St. Louis, on the occasion of his eightieth birthday, June 14, 1942. His Excellency's service to our Association as Spiritual Adviser and Honorary President for eleven years has merited whatever marks of affection and respect the Association may be able to show to His Excellency. We feel grateful to almighty God for the long years which have been granted to our Spiritual Guide and Leader. We rejoice with His Excellency in the unusual fruitfulness in achievements for God and mankind of a life, many sections of which would have entitled not one but many individuals placed in exalted positions to ineffaceable memories in the history of the Church.

At the time of his consecration, the youngest bishop in the United States to be elevated to such a dignity, an organizer, a builder, an administrator, a financier, a teacher, a civic leader, His Excellency is still to the people of his Archdiocese first and foremost great as a priest and as a bishop. Associations which he has founded or promoted, institutions which he organized or fostered, movements which he inspired or reinvigorated, personalities whom he discovered or assisted toward achievements, all bear testimony to the widely comprehensive interest and influence and power of His Excellency. A multiplication of parish churches and schools, the promotion of vocations to the priesthood and to Religious life, the erection of the Major and the Preparatory Seminaries, the personally supervised development and building of one of the few truly outstanding cathedrals in our land, the promotion of Catholic secondary education through the organization of diocesan and parochial high schools, the deep concern for Catholic higher education and learning as manifested in his interest in local colleges and universities and in the Catholic University of America, all these achievements representing intellectual resourcefulness, aggressiveness, and initiative, no less than vast financial investments are all to be credited to His Excellency's more than 46 years as bishop and his almost 40 years as Archbishop of St. Louis.

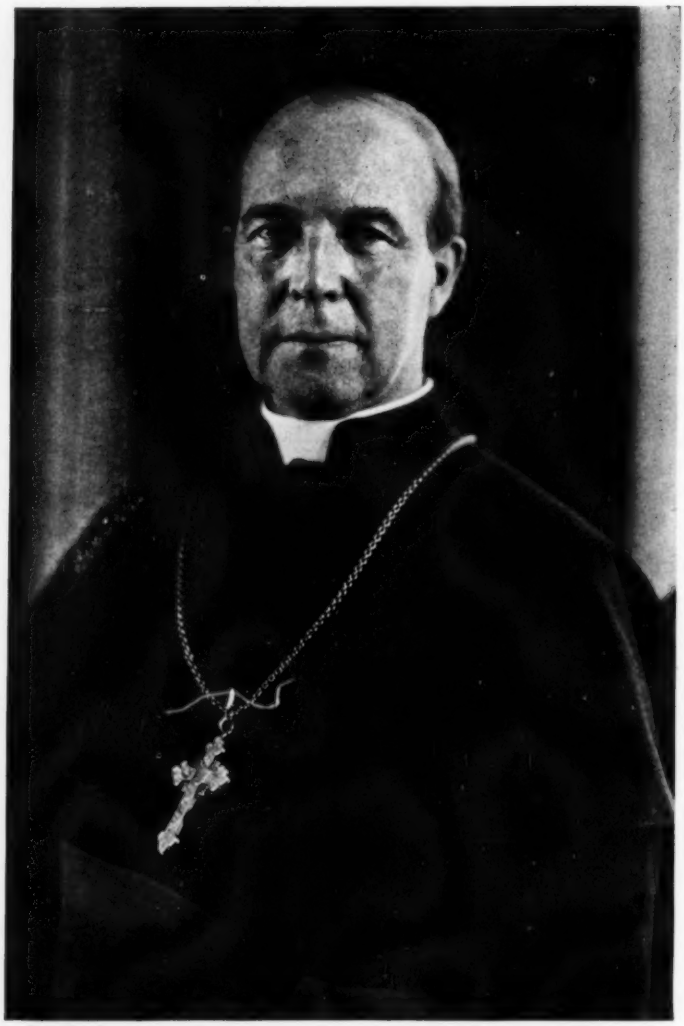
The Catholic Hospital Association owes to His Excellency a debt of gratitude which can scarcely be repaid. His spiritual advisership as well as his Honorary Presidency have never obtruded themselves upon the Association. The functions of these offices have been performed with suavity, with delicacy, and with forbearance, but never with weakness or indecision or vagueness. The Officers of the Association have always felt that a sympathetic and judicious hearing would be extended to them on all occasions when the interests of the Association needed a tactfully guiding judgment in its problems. The deep interest of His Excellency in the Association was particularly manifest at the time of the St. Louis Convention in 1940 when Hix Excellency was pleased to participate intimately in the affairs of the Association. At other times as well, however, His Excellency's deep concerns were equally shown to those who understood.

For the occasion of His Excellency's eightieth birthday the Sisters of the Association presented their Spiritual Bouquet, composed of offerings of prayers to call down God's blessing upon one who in so sublime a manner personifies the spiritual leadership of Christ. We cannot but flatter ourselves that among the many interests which His Excellency has so deeply at heart a special place is accorded to our Association, and it is by reason of this that the Sisters instinctively feel the genuineness, the sincerity of His Excellency's regard for the Association and his appreciation of its purposes, its motives, and its activities.

With its congratulations, the Association offers to His Excellency the assurance of its prayers that many more years of life may enable His Excellency to reach, if possible, still higher peaks of achievement for God, for souls, for country, for human betterment.



Rev. Alphonse M. Schwitalla, S.J., Pres.
Catholic Hospital Association



HIS EXCELLENCY, THE MOST REVEREND JOHN JOSEPH GLENNON, D.D., ARCHBISHOP OF ST. LOUIS; HONORARY PRESIDENT AND ADVISER OF THE CATHOLIC HOSPITAL ASSOCIATION

THE SPIRITUAL BOUQUET OFFERED BY THE HOSPITAL SISTERS OF THE UNITED STATES AND CANADA TO HIS EXCELLENCY, THE MOST REVEREND JOHN JOSEPH GLENNON, D.D., ARCHBISHOP OF ST. LOUIS AND HONORARY PRESIDENT AND ADVISER OF THE ASSOCIATION ON THE OCCASION OF HIS EXCELLENCY'S EIGHTIETH BIRTHDAY, JUNE 14, 1942
IN THE ORIGINAL THIS PAINTING PREPARED BY SISTER M. CORDIA, S.S.M., ON MOIRE WAS APPROXIMATELY 9 x 12 IN.

The History of Hotel-Dieu De Saint Joseph in Montreal, Quebec, Canada

IV. The Service and Growth of Hotel-Dieu

Mr. Charles Gerard

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***AUTHOR'S NOTE:** In the three articles already published in this series we related the circumstances and events which brought about the founding of Hotel-Dieu Hospital and Ville Marie, as the City of Montreal was then called. Monsieur de Maisonneuve, Jeanne Mance, and the first group of settlers had — after a winter in Quebec — finally reached the Island of Montreal. They found it well suited to their courageous plan of creating a Christian settlement of French and Indians, which could serve as an advance base for further missionary work to be carried into the interior of Canada.*

We saw how Jeanne Mance lived and worked in Ville Marie, in close cooperation with her ecclesiastical and civil authorities, thereby preparing the way for the arrival of her future spiritual advisers, the "Gentlemen of Montreal" and her beloved Hospitallers of Saint Joseph.

THERE was not much time to be lost. Jeanne Mance knew it better than any other person of the settlement. The Fathers of La Compagnie de Saint-Sulpice and the Hospitallers of St. Joseph simply had to come to Montreal as soon as possible.

While the Governor, M. de Maisonneuve, did his best during his visit to France to prepare for the departure of both the Fathers and the Hospitallers, our heroine, Jeanne Mance, on January 28, 1657, suffered a serious accident when she fell on the ice of the St. Lawrence River. A severe fracture of the right forearm developed into such a complicated case that her physician, Dr. Etienne Bouchard, and another in Quebec City, advised her to go to France for a further examination and possible treatment.

Jeanne at first hesitated. Then, after the arrival of her Governor with four spiritual sons of Monsieur Olier in Ville Marie, and the definite news that the Hospitallers of St. Joseph were soon ready to come, she decided to make another trip to France, not forgetting the future temporal needs of the Sisters in whose hands she wanted to entrust her own work. Another appeal to Madame de Bullion for help, a personal visit to the Sisters, and the cure of her arm were her objectives. On September 29, 1658, Jeanne Mance, with the blessings of Monsieur de Queylus, the Superior of the Saint Sulpician Mission in Montreal, left for France. Monsieur Gabriel Souart, the first priest of Ville Marie, and two other Sulpician Missionaries, Monsieur Dominique Gallinier and Monsieur Antoine d'Allet, under the able guidance of their Superior, began immediately after their arrival the transformation of Ville Marie from a missionary post into a parish. For two years they occupied two rooms within the hospital, until the arrival of the Hospitallers in 1659.

Jeanne Mance was accompanied by Marguerite Bourgeoys, who, like our heroine, needed more help for her educational work amongst the settlers. They arrived in La Flèche on December 24, 1658.

Success and a Miracle

After the celebration of Christmas with the Sisters of Hotel-Dieu of La Flèche and a meeting with Monsieur de la Dauversiere, neither Jeanne Mance nor Marguerite Bourgeoys were in doubt about their main objective. Both knew that they would soon return to Canada with the first Hospitallers of St. Joseph at their side. Their talks about the hospital and the grateful settlers, about the need for more help in every way, were not in vain, apart from the fact that the Sisters in La Flèche realized themselves that the time had actually come for a final decision.

By now Jeanne Mance was strong enough to travel again. Marguerite Bourgeoys had gone to the Champagne while the former stayed in Paris for various visits. She also consulted the Chief Surgeon of the King regarding her arm. But nobody was able to help her. Then, on February 2, the Feast of the Purification of the Holy Virgin, she decided to visit the Seminary of the Sulpician Fathers. She knew that Monsieur Olier had died on April 2, 1657, and was informed that his heart was piously preserved in a special leaden container within the Seminary. After her conference with Monsieur de Bretonvilliers, the successor to Monsieur Olier, she attended Mass, unaware of the great miracle which God seemed to have in store for her. Her own words describe best what happened:

After having held the small container with the heart of M. Olier in my left hand and while meditating upon the graces which God had granted through this saintly heart, I placed it upon my right hand which was still completely covered with bandages and was held in place by a sling, whereupon I immediately felt that my hand became free and that it could carry without support the leaden container wherein the heart was preserved; the use of my hand had returned at that moment.

After thanking God for having granted her this great favor, Jeanne continued her visits in the capitol

of France. Madame de Bullion received her as seldom before. Rejoicing with her about the miraculous healing of her arm and the joyful news about the decision arrived at in La Flèche, she gave Mlle. Mance the sum of 22,000 pounds, of which 20,000 pounds were to be invested to produce a yearly pension of 1000 pounds for the maintenance of the four Sisters who were soon to go to Montreal, and the rest was to be used to cover the expenses of that profitable voyage of her protégé. Besides these gifts, an unknown benefactress gave her several valuable ornaments which she could use in the decoration of the new parish church of Ville Marie.

Finally on March 29, 1659, the memorable contract was signed between Mlle. Mance and M. de la Dauversiere, stipulating "That the 'Associates' (the Members of the Society of our Lady of Montreal) should send — without delay three Hospitallers and one servant from the Order of Hospitallers of La Flèche to Montreal, and none from any other community; further, that Mlle. Mance should remain the chief administrator of the hospital for the rest of her life" and "that regular daily prayers should be offered by the Sisters for their founders and patrons, etc." Then it became clear to all that from now on the future development of Ville Marie and its hospital was assured.

The First Sisters

Who were those first Sisters chosen by their founder to go to Ville Marie? Their names and deeds are too well known by now, to be dwelt upon at great length on this occasion: Mother Judith Moreau de Bresoles, Sister Catherine Mace, and Sister Marie Maillet. Who has not heard of them? These were the first and territorially most advanced hospital missionaries in Nouvelle France. To them fell the great task to keep up and to extend the good work of Jeanne Mance.

Before their departure Sister Judith de Bresoles was appointed Superior with Sister Mace as her assistant, while Sister Maillet took charge of the Depository. All was well and ready for their departure when suddenly, like so many times before, everything appeared to be lost and the whole plan threatened to become a fiasco. First, M. de la Dauversiere took sick, then some competitive forces tried to discourage the new colonization efforts and later even riots broke out with the sole aim of preventing the departure of these Sisters who were eager to be on their way. Jeanne Mance and Marguerite Bourgeoys waited patiently in La Rochelle. With them were some Sulpician Fathers, who followed those already busily engaged in the Parish of Ville Marie, and four other girls who accompanied Mlle. Bourgeoys to Montreal. All were inspired by the same love and devotion to the Holy Family. Their ship, the St. Andre, prepared to sail.

M. de la Dauversiere, standing for the last time on the bridge of this ship, asked God's holy blessing upon the work of his foundation in Montreal. Who could have imagined at that time that soon he was to sail himself — not into the wilderness of Canada — but along the waters of Eternal Peace.

This scene of departure became famous because it really marked the beginning of the work of the Hospitallers of Saint-Joseph upon this Continent. Far beyond this, it represents until this day, and let us hope for all time to come, the transformation of the hard-working, faithful M. de la Dauversiere, who worried and suffered most of his life for his spiritual daughters, into a spirit whose force and guidance can still be felt wherever there is a Hospitaller of St. Joseph, a true Catholic and a generous and charitable heart. His earthly ship was thus launched.

M. de la Dauversiere Dies

On November 6, 1659, at the age of nearly 63 years, this great founder of Hotel-Dieu died at La Flèche, just as he lived and worked all his life: in poverty and with the unshaken faith that God would continue, through the Sisters, the development of his beloved Institute.

The trip of the St. Andre from La Rochelle to Canada again proved very difficult. The St. Andre left La Rochelle on July 2, 1659, and did not arrive in Quebec until September 7 of the same year. Typhoid fever and other diseases had severely and in some cases fatally attacked the ship's company, so that our first Hospitallers were kept on "day and night duty" for many weeks.

Hospitallers Arrive

After a short stay in Quebec, we find Mother de Bresoles, on October 2, 1659, being officially installed as Superior of the small but most promising Community.

Life within the hospital and Ville Marie was marked by the great faith and patience which distinguished these early Sisters from France. Inspired and aided by their chief administrator — Jeanne Mance — they prepared their own medicines from herbs grown in their beautiful cloister gardens. The Sisters accepted the hardship and suffering of Canadian winters and the repeated attacks of Indians in the same heroic manner as their leader, "the Angel of the Colony," whose health, after the accident, gave great concern to the Sisters and the colony. Although she still remained very active in the hospital and social life of the Community of Ville Marie, those about her realized that she was nearing the end of her earthly journey.

However, not before performing another great and historically important act did our heroine close her eyes forever.

Once more, as new dangers approached, she saved the colony with the money entrusted to her and for the last time she went to France with the Governor, M. de Maisonneuve, to make another personal appeal for funds and new recruits to Madame de Bullion and the members of the Society of Montreal.

During this final visit to France, Jeanne Mance, on March 9, 1663, also took part in the ceremony which transferred all legal rights and privileges of the Society of Montreal to the "Gentlemen of the Seminary of Saint Sulpice of Paris." This act, seen in the true light of our present-day knowledge of the events of her time, once and for all gave to Jeanne Mance the assurance that her hospital and the new settlement would live forever.

Jeanne Mance Goes to God

After her return to Canada, her health gave rise to even greater anxiety amongst the Sisters who saw their beloved foundress during her daily walks and later nursed her, who above anyone else had cared all her life for others. Finally, on June 18, 1673, at 10 p.m., Mlle. Jeanne Mance followed M. de la Dauversiere into Eternity, deeply regretted and sincerely enshrined in the hearts of all citizens of Ville Marie.

What this first Canadian lay nurse did for the Hospitallers of St. Joseph, for Ville Marie, and in the end for Canada and the United States, can hardly be exaggerated. She not only laid the foundation for one hospital and its various functions — technically and socially — but she also, as a lay nurse, initiated a social service during her many visits of sickbeds in block houses and tents, which deserves our highest admiration. A true pioneer, a devout Catholic, and an heroic woman had left this world.

May her courage and faith continue to guide and inspire all those who so generously follow her brilliant example of charity and whose prayers and services are dedicated to the sick and poor.

In our story we are now entering a new period in the life of the Hospitallers of Saint Joseph. Their charity and kindness toward the sick and suffering, and the ever increasing demand upon their services would fill many more pages in this series. Many books and articles were published in recent years, paying tribute to this later period, so that I will not attempt at this time to repeat or tell in greater detail their glorious story. Instead, let us briefly review this period in its relation to the continued growth and scientific progress of the hospital, although we must keep in mind the great spiritual conquest which at all times has accompanied the charitable service of these Sisters.

For many years the Hospitallers worked in close cooperation with their Mother House in La Flèche. They took care of all sick and wounded within the vicinity of Montreal, even from the district around Lake Champlain (in 1756) and from Belle-Riviere (Ohio). Three large fires within forty years, plagues and epidemics, endangered more than once the very existence of this only hospital of Ville Marie. But in spite of all hardship, Hotel-Dieu served for nearly two centuries as the only military and civil hospital on the Island of Montreal.

At the end of the sixteenth century the settlement had grown considerably and a number of girls from Ville Marie were ready to dedicate their lives to the noble task of the Hospitallers. They took their places beside those who until that time had come from France.

Congregation Recognized

The Institute in the meantime also won full recognition from the Church and State, and the "Congregation of the Daughters of St. Joseph" had already become (on January 8, 1666), through Papal decree, the "Institute of Religious Hospitallers of Saint Joseph," governed by the rules of Saint Augustine.

The Sisters, in the year 1677, took complete charge of all administrative matters concerning the hospital, although their gratitude toward the "Gentlemen of Montreal" found at all times a sincere expression in their cordial relations and mutual assistance.

In 1760 the French rule in Canada had ended. The King of England became its sovereign and between the years 1776 and 1777 the wards and cloister gardens of Hotel-Dieu were filled with wounded soldiers. All races and creeds were represented. The American Declaration of Independence and its consequences kept Hotel-Dieu busier than ever.

Under these circumstances there was, of course, not much time for the Sisters to think of new foundations or an extension of their Order on this Continent. Both regimes, the French and the English, appreciated the voluntary charitable service which they received from Hotel-Dieu and always treated the Sisters during these troublesome years with the greatest respect. Some figures of this period aptly illustrate their work and sacrifices, if we keep in mind that all medical supplies had to be imported from overseas.

Between 1776 and 1777 more than two thousand English soldiers were treated within its walls.

From 1760 to 1860 the Sisters nursed nearly 87,400 patients, and to bring this figure up to date and also as a matter of comparison, I should like to say here that from 1860 to 1939 nearly 261,900 sick found a friendly welcome at the doors of Hotel-Dieu.

Not until the beginning of the nineteenth century had these poor Sisters time and means enough to think of another foundation outside of Montreal. A list of their various houses, with the date of their foundation, may help us to realize the rapid growth which began in 1845 and has continued until this very day.

Foundations in Canada

Hotel-Dieu of Kingston, Ontario (1845).
Hotel-Dieu, Chatham, New Brunswick (1865).
Hotel-Dieu, St. Basile, New Brunswick (1875).
Hotel-Dieu, Arthabaska, Quebec (1884).
Two hospitals at Campbellton, New Brunswick and one at Windsor, Ontario, followed in 1888.
Hotel-Dieu, Tracadie, New Brunswick (1890).
Cornwall's Hotel Dieu was founded in 1897.

Hotel-Dieu, Valle de Lourdes, New Brunswick (1931).

Hotel-Dieu, Barrhead, Alberta (1940).

Foundations in the U. S. A.

Fanny Allen Hospital, Winooski, Vermont (1894).

St. Bernard's Hospital, Chicago, Illinois (1903).

Hotel-Dieu, Polson, Montana (1916).

St. Joseph's Hospital, Hartford, Wisconsin (1920).

Bishop de Goesbriand Hospital, Burlington, Vermont (1924).

Community Hospital, New London, Wisconsin (1926).

Langlade County Memorial Hospital, Antigo, Wisconsin (1933).

St. George's Hospital, Chicago, Illinois (1939).

Hotel-Dieu, Van Buren, Maine (1939).

Toward the middle of the nineteenth century the old buildings on St. Paul Street became too small. Ville Marie soon changed into a real city and was called Montreal. In 1861 Hotel-Dieu's present hospital, with about 350 beds, was constructed and later on improved and enlarged by various additional wings.

300 Years of Service

This year, the Hospitallers of St. Joseph celebrate their three hundredth anniversary with the opening of their latest "wing," named after their venerable founder, M. de la Dauversiere. With these new facilities, Hotel-Dieu of Montreal can accommodate about six hundred beds and its Hospitallers, under the able leadership of their Superior, Reverend Mother Allard, and in cooperation with their medical staff and nurses can, without interruption, continue their historic march of progress. So far the highlights of Hotel-Dieu's development.

Many interesting people, prominent in the history of France, Canada, and the U. S. A. have contributed to its growth and happiness. The Hospitallers are fully aware of this fact. Names like "Fanny Allen" mean to them a history as glorious as any of the earlier days. Governors and heroes have come to this shrine of Catholic Charity to pay tribute to the heroines of the past and admire the courage and faith, the spiritual and professional perfection which dominates within those ancient walls of Hotel-Dieu.

A wonderful museum, with a priceless historic collection, may some day show you, when you visit these Sisters in Montreal, how Providence has so successfully guided them and their City to the realization of every detail contained in the now famous visionary plans of its beloved founders, M. de la Dauversiere, Jeanne Mance, and Madame de Bullion. May their names live forever!

The Housekeeping Function in the Hospital

Sister M. Conchessa, C.S.J., R.N., M.A.

HOUSEKEEPING is today an integral part of the whole organization of any hospital, but it is also a department which is of sufficient importance to require separate and special treatment. No department makes a larger contribution to the smooth and efficient working of the whole institution, and this fact is more true today than it was years ago, for reasons that are obvious.

The matters which come under the direction of the housekeeper are most often those on which an institution is judged. Hence, it is imperative that special care be given to the selection and training of housekeepers. There is no good reason why more attention should be given to the selection of a nursing supervisor or a classroom teacher than to the selection of a housekeeper. In actual practice, however, training in systematic and thorough supervision of this important service has been given little thought. Obviously, scant consideration has been granted to the social problems of labor or to vocational guidance, both of which are essential factors in the success of the housekeeper and her aides.

Hotel housekeeping has received far more interested and intensive study than has hospital housekeeping and, as a result, its achievements are very much superior at the present time. Hotel managers long ago realized the economic asset which clean and efficient housekeeping might be, and they proceeded to train housekeepers in a businesslike way. The basis for the pleasant atmosphere which hotels afford their patrons is clean and orderly housekeeping. Psychologically, the same effect is achieved on the ill person as on the well person. Hotels have been stimulated by competition to keep their standards high. Too often, unfortunately, attractiveness has not been listed as an essential asset in the hospital.

Basic Training Needed

The housekeeper of a hospital should, of course, have a working knowledge of the mechanics of housekeeping. This can be learned in apprenticeship, but under present conditions it would seem to be impossible to train candidates for housekeeping positions without some formal instruction. Courses are now available in vocational schools and in some universities where students are given a wide range of technical training, which, according to their aptitudes,

CLERICAL ASSISTANT MAINTAINS RECORDS OF HEALTH, TIME, VACATIONS AND SALARIES OF EMPLOYEES FOR THE SISTER HOUSEKEEPER AND AIDS IN PREPARATION OF WRITTEN SCHEDULE OF DAILY DUTIES FOR EACH JANITOR OR MAID

should fit them for a clearer understanding of the mechanical and also the social aspects of their work. The method of trial and error is, understandably, incompatible with the expensive equipment used in all hospitals today. Experience is a valuable teacher only when the experience is gained under competent supervision, without waste of time or material. Supervisors of scrubbing, dishwashing, waxing, sweeping, or laundering should know why one method or material is superior to another, and under what circumstances each is to be used. A large part of housekeeping weariness comes from blind routine effort, without intelligent direction.

At St. Mary's Hospital the Sister Housekeeper has had many years of experience in dealing with employees and she has developed good qualities in organization and in general planning. Another Sister supervises the divisional and follow-up work. She also has charge of the upkeep of the nurses' residence. Painting and repairs are in charge of the head housekeeper. A clerical assistant is employed by the housekeeper to keep the records of health, time, vacations, and salaries. All employees belong to one of the local branches of the American Federation of Labor Maintenance group.

Personal Contacts Helpful

An attempt is now being made to keep a personnel chart, in addition to the health chart. Notations are made on the employee's record concerning the grade of work done, the degree of improvement in service, the extent of cooperation, and the traits of personality. This file has been found necessary because of the continuous stream of requests for recommendations of employees. It is an aid within our own organization because a notation of every suggestion given to an employee is made and given to the employee in writing. If it is found necessary to dismiss an employee at any time, the written complaints are a verification of unsuitable work and a protection against the charge of unjust discrimination.

The Assistant Superintendent at St. Mary's Hospital is the final authority to whom the Housekeeper refers in most matters. There are few references to the Superintendent except in the conferences which are held on vital matters. The Housekeeper has charge of maintenance and she assigns duties to the employees. Another Sister assists in maintenance supervision. The Housekeeper buys and dispenses all janitor's supplies and all cleaning material. All requisitions go to the Housekeeper's office on Monday morning of each week. These are checked carefully and compared in order to prevent waste. We find that occasional checking with the supervisors and heads of departments creates a better atmosphere and a better understanding of employees. Smoother running departments result from daily contacts with each person whenever possible, as do occasional group meetings to discuss problems. Friendly contacts with employees usually insure loyalty. If employees know what is expected of them their interest will be aroused and their cooperation can be secured more easily.

Beyond the daily routine work of painting and wall washing, the Housekeeper consults with the Sister Assistant Superintendent at St. Mary's Hospital concerning special work and the help to be employed

YOUNG LADIES OPERATE ELEVATORS AT ST. MARY'S HOSPITAL, CARRYING PATIENTS, VISITORS, AND NURSES TO THE VARIOUS FLOORS AND DEPARTMENTS.

YOUNG MEN, IN USING A MODERN FLOOR WAXER, SAVE TIME AND DRUDGERY IN THE SCHEME OF HOUSEKEEPING AT ST. MARY'S HOSPITAL

in addition to the regular personnel. Formerly, one section of the hospital was vacated for renovation and when that section was decorated another section was vacated. Now, however, with the crowded condition of the hospital, it is difficult to achieve the best results in cleaning and renovating.

St. Mary's Hospital employs one full-time painter and one wall washer. Our location is a considerable distance from the business and industrial districts and hence the cleaning problem is not so serious as in more smoke-ridden areas. It is necessary to wash completely the walls and ceilings of the patients' rooms every six months to one year, and to paint them every four or five years, depending upon the location of the hospital. Corridors and special departments may, of course, be washed and painted more or less frequently.

Each janitor and maid is given a written schedule of daily duties. Special work required on certain days is specified. In addition, one of the janitors or maids who has been in service some time, and who has given satisfaction, may be assigned for a few days to help the

YOUNG LADIES WITH A LITTLE TRAINING PROVE OF GREAT ASSISTANCE AT MEAL TIME IN SERVING BOTH GENERAL AND SPECIAL TRAYS TO PATIENTS

beginner to become familiar with the physical plant and the assigned duties. The Housekeeper gives some part of her morning in following up and giving assistance to the new person for the first week. In so doing she not only economizes on her own time, as well as on that of the beginner, but she also has the opportunity to evaluate his or her fitness for the work.

Employees' Maintenance

The maintenance of employees is an item of importance at the present time. Many of the hospitals in Minneapolis have dispensed with this problem by giving, in lieu thereof, an additional fifteen, twenty, or thirty dollars in wages. If, however, the hospital has housing space available, it is advisable to supply rooms for the employees. Our janitors are nearly all unmarried and they room in quarters which are separate from the hospital building. The eighty women employees live at home but meals are served to them while on eight-hour duty. If the women live at the hospital the additional duty of supervision devolves on the hospital. Under present conditions this is a hardship, but it is more than compensated for in the greater loyalty and finer service which results. I believe that boarding all employees is more economical if dining-room space is available. Some hospital administrators say that they save by having all help obtain room and board outside. Individual conditions may alter the situation but, in general, where there is a large personnel, it seems to be more economical to serve meals.

All cleaning material, equipment, machines, and similar supplies are purchased by the Housekeeper. She is not expected to consult the Assistant Superintendent except when the purchase entails a considerable financial outlay. We have found that electrical equipment is a good investment with the rising cost of labor.

Salaries Standardized

The scale of salaries is based on an average of the same type of work throughout the city. Nearly all hospitals have the same standard salaries. In many of the hospitals the maintenance group belongs to one of the divisions of the labor organizations. Weekly maximum working hours, over-time pay, free days, and all such specifications have made the position of the housekeeper a much more serious and responsible one than it was considered ten years ago.

Very few of our employees are contacted through employment agencies. Most of the women who apply come from rural areas within a radius of fifty to

seventy-five miles of the city. A recommendation from some reliable person in the neighborhood of the potential employee (the priest, if the girl is a Catholic) is required, as well as a recommendation from the last employer. If it is a girl's first experience away from home, the parents are notified that she will not be under the hospital supervision after working hours. The hospital assists in finding a suitable rooming house nearby. A complete physical examination has not been required thus far. The Mantoux test is given annually to each employee and it is followed by X-rays if a positive reaction occurs. The Wassermann is exacted only of the chef, assistant cooks, the baker, and others who handle food.

When there is noticeable lassitude, slowing-up, loss of weight, or similar symptoms, the employee is sent to one of the staff doctors, who gives the hospital a report. If a rest is advised, the hospital suggests a vacation and the employee is required to report to the doctor before returning to work. If medical attention is needed, a hospital ward bed is provided. For short hospitalization, no bill is rendered. Greater assistance and consideration are, of course, given to employees who have given a long period of service to the institution.

After one year's service, a two weeks' vacation with pay is given. If the employee is paid before leaving for his vacation, it is expected that he will remain in the service of the hospital for three months after his vacation, although this cannot, of course, be made arbitrary. If there is a previous agreement, the employee may be given his vacation pay on leaving, such a case being considered a resignation with notice. Notice of resignation or discharge is given by the employee, or the hospital, at least one week in advance.

Housekeeping As a Special Branch of Service

Housekeeping is generally considered as subsidiary to nursing service, but it might be well to consider it another branch of nursing service. To the patient, a neat room may mean more than a medication given to stimulate an appetite or dispel depression. The superintendent and the housekeeper should have a clear understanding of the duties classified as household and those assigned to nursing service. The supervisor on the nursing division should be cognizant of both phases and be able to adjust either, with or without the help of the nursing director or the housekeeper. When work is below standard, the supervisor of the group should give special assistance or dismiss unsatisfactory workers.

It is generally recognized that hospitals must have a personnel for household duties as capable as the best hotel personnel. Basic functions are the same. Methods and techniques alone vary. Both large and small hospitals require efficient personnel. The selection of properly qualified housekeepers is the starting point in improvement.

Patience a Necessary Requisite

The Housekeeper in the hospital must have an unlimited amount of patience. She deals with a somewhat transient group, varying in physical, mental, and social make-up. As an executive she must have an understanding of their problems and be able to give suitable advice and assistance. A saving sense of humor will be an almost essential asset. Kindness and patience will bring valuable returns. The challenge is interesting and worth while to anyone who has character and training enough for her job. Instruction is never complete. To instruct, to make oneself clearly understood, and to thoroughly understand human nature in all its varieties, are required to execute the office of housekeeper in the hospital.

The Housekeeper should above all be so well able to organize and administer this service that everything will run smoothly in her absence. A feeling of trust and cooperation should be cultivated. When necessary, she should be able to work with the employees and still maintain her dignity. It is imperative that the higher superiors in our communities give more serious thought to the selection of Sisters for the position of housekeeper in the hospital and also that they give them opportunities to prepare for this important position.

RECREATION AND LIVING ROOM PROVIDES DESIRABLE PLACE FOR EMPLOYEES TO HEAR RADIO PROGRAMS, READ, OR GATHER OUTSIDE OF WORKING HOURS FOR GENERAL RELAXATION

An Evaluation of the Graduate Nurse in Hospital and Nursing School Work*

Sister M. St. Elizabeth, R.N.

TODAY the value of the graduate nurse in both hospital and nursing school has advanced markedly on account of the increased demands and opportunities for her services.

For the past few years there have been periodical suggestions that a shortage of nurses was very probable. The present war, with its tremendous and unpredictable developments, stretching its tentacles far across the seas, resulting in the inauguration of extensive defense programs, has precipitated a positive shortage.

In addition to the absorption of many nurses into military programs, many other factors during the past decade have been influential in reducing the numbers of nurses available for nursing care: the closing of many small schools and staffing the hospitals with graduate nurses; the reduction of student enrollment in many larger schools, and the almost universal acceptance of the eight-hour day for graduates. Also, since the development of the Defense Program in the United States there has been a steady emigration of Canadian nurses to fill positions left vacant by nurses serving with the United States army and navy. Finally, there has been the call for three hundred nurses for service in South Africa.

The shortage may last for some time, and hospitals, therefore, are confronted with the problem of discovering how they can best use and conserve the nursing service at their command. This demands a survey of the qualifications of the nursing staff.

In the short time at my disposal for preparing these notes, it was not possible to secure much information in connection with the methods followed for the evaluation of graduate nursing personnel. It would seem, from some facts obtained, that in many hospitals there have been such frequent changes in staff nurses that no attempt has been made to evaluate their services or qualities. The London Central Registry has been compiling records in connection with efficiency and adaptabilities of its registrants for the past few years, as a first step toward the possible grading of nurses, but its work covers only a small percentage of the registered nurses of the Province.

It would seem that now is the opportune time for hospitals and nursing agencies rapidly to develop programs for the evaluation of their graduate nurses and nursing service.

With a knowledge of the valiant way in which nurses have met problems in the past, we can feel assured that, with proper guidance and assistance, the graduates of the present will not be found wanting. They possess intelligence, alertness, courage, initiative, and good will, and the greater majority of them have received good secondary school education followed by adequate nursing education and experience.

A careful survey of promising nurses among junior members of the staff, and even of senior student nurses, would, no doubt, lead to the discovery of qualities that make for leadership, if developed and directed. These nurses should be encouraged and helped to qualify themselves for positions of responsibility in the nursing fields. It is to fill the positions on hospital staffs and public health agencies left vacant by well qualified nurses who are serving with the military forces that the greatest difficulty is being experienced. This need demands immediate advanced preparation of other graduates if the protection of nursing education is to be guaranteed.

Closer observation of junior staff members by supervisors, and individual conferences between these two groups are suggested as means of helping to determine special qualifications and aptitudes. The Canadian Nurses' Association has established a fund to help defray the expenses of those who are qualified to undertake advanced nursing study and are not able to finance it.

An evaluation of existing hospital nursing procedures would, no doubt, reveal many instances where time and energy could be saved with consequent spreading out of the nursing service with no detriment to the quality of nursing care rendered. We are all aware that many duties, not essentially nursing, now performed by graduate nurses, could be carried out satisfactorily by subsidiary workers.

The introduction of more ward aides has been suggested to meet the need, but the necessary supervision of these inexperienced workers would have to be supplied by graduate nurses. Others have suggested a great increase in the student-nurse enrollment. This would increase the expenses for education and also, in many cases, would require an increase in the teaching personnel. If at present the nursing profession is being blamed, at least in part, for the shortage of nurses because of reduction of student enrollment during the last decade, may it not be blamed again in a few years should it happen that the supply of nurses is much greater than the demand for their services.

A word of warning has been sounded in regard to the increasing responsibilities which may be placed upon graduate staff nurses as a result of the shortage

*Presented at the meeting of the Ontario Conference of the C. H. A. at St. Michael's Hospital, October 7, 1941.

of interns in many hospitals. Only such minimal extension should be permitted as is justified by real need. The assumption of medical responsibilities by the nurse is fraught with danger not only to the patient but also to the professional standing of the nurse. It places added responsibilities on both school and hospital. There is no doubt that graduate nurses could be taught the technicalities of these procedures and perhaps would perform them with more skill than some interns, but the very necessity for delegating these duties to nurses — the shortage of doctors — may leave the patient unprotected in cases of severe reaction or other emergency. There is also great danger that the direct nursing care of the patient may be gradually weaned away from the profession, because of the addition of more and more clinical procedures.

Much can be done to make the field for staff nurses, particularly the general-duty group, more attractive. Salaries in many centers are very low, living conditions are not attractive, and there is not always a guarantee of advancement. It is the high salaries and shorter hours of work that are attracting the large numbers of our younger graduates to the United States.

Many schools are unable to secure properly prepared instructors. Good nursing care depends upon good teaching and good teaching implies well prepared personnel. It has been suggested that nurses who have had wide experience in nursing patients in their own homes might, with some assistance in principles of teaching, supplement the teaching of the instructor in the classroom. Many otherwise qualified teachers have had no practical experience in private-duty nursing in homes, and therefore find it difficult to impress the students with the necessity of learning how to improvise equipment. This is essential, especially in wartime. Other qualified nurses who have left the nursing field on account of marriage, or for other reasons, might be induced to teach part time. This plan would allow the instructor to devote considerable time to clinical teaching on the ward, thereby relieving the head nurse of some of her teaching load. We all agree that clinical teaching is essential in the school program, and it should not be allowed to deteriorate.

Let us thoroughly study and become familiar with our own institutions and know how far we can retrench if necessary, and still through proper employment of resources, meet the nursing problem from within.

In the stress of present difficulties, our Catholic hospitals and nursing schools must be most watchful that everything is done to maintain the Catholic atmosphere and spiritual ideals which have always permeated our institutions.

The Modernization Program of St. Francis Hospital, Peoria, Illinois

Sister M. Ancilla, O.S.F., R.N., B.A.

Introduction

THE recently dedicated eight-story new wing is the latest addition of a modernization program begun in 1936 and marks the hospital as one of the most modern in the Middle West. St. Francis Hospital is the first of 12 hospitals[1] operated by the Sisters of the Third Order of St. Francis, in the States of Illinois, Iowa, Michigan, and South Carolina.

In presenting this description of the most recent unit added to the mother hospital of our order in this country, it might be well to review briefly the growth of this hospital. Established in 1876 in a frame, two-story home, St. Francis Hospital was founded by five Sisters who had arrived in this country barely a year before. Sister M. Frances was the first Superior and to her had been assigned as assistants, Sisters M. Barbara, M. Liberia, M. Thecla, and Sister M. Ositha. This small band of religious constituted the first nursing staff of the hospital. Amid hardships and many difficulties, these pioneering Sisters carried on their work, assisting the city authorities in caring for the people of the community. In fact, when the city fathers found it impossible to maintain the City Hospital, the Sisters continued to render hospital service to the struggling community of Peoria.

Shortly after, however, the need for larger quarters became acute. The first specially constructed hospital was completed in 1878, affording accommodation for 30 patients. In 1885, a second unit was completed, while in 1901 another large unit was added. The demand for service continued and, in 1918, the Sisters again enlarged and otherwise extended the facilities of the hospital, now to care for 350 patients. In 1923, a special chapel was added. In order to afford the Sisterhood ample room to develop, a convent was added in 1930 to the group of buildings constituting St. Francis Hospital. In this convent, ample provision was made for the novitiate, living accommodations for novices and all resident professed Sisters, an auditorium, an oratory, etc. Approximately 250 Sisters can be cared for in this convent.

[1]Other hospitals are located at: Bloomington, Pontiac, Rockford, and Galesburg, Illinois; Burlington, Keokuk, and Ft. Madison, Iowa; Escanaba, Menominee, and Marquette, Michigan; Rock Hill, South Carolina.

NEW WING OF ST. FRANCIS HOSPITAL, PEORIA, ILLINOIS. VIEW FROM THE RIVER SIDE

General Service Features

The new wing, approximately 155 ft. by 50 ft., contains most of the central service facilities for the entire institution consisting of a 500-bed hospital, nurses' home accommodating 150 students, motherhouse and convent accommodating about 150 Sisters.

The partial subbasement contains the mechanical and electrical power equipment, the automatic switch and battery set for the emergency lighting system, the central gas room for the anesthesia gas piping system and the mattress sterilizer. The subbasement is connected by passage with the laundry located in the power plant 150 feet distant. A service elevator travels to all floors from the subbasement level, thus facilitating communication and prompt delivery.

The basement has a service drive entrance at the rear and provides space for the receiving office for all materials, shops for maintenance crews, three large storage refrigerators, the ice-making and storage facilities, food storage, the employees' locker rooms, and dishwashing equipment. There are three dumb waiters to facilitate bringing supplies from the basement storerooms to the kitchen on the first floor.

The First Floor

The first floor is divided into two parts. At the south end is a waiting room, restrooms, and two emergency operating rooms opening off the corridor which connects the ambulance and patients' entrance with the enlarged and renovated patients' receiving and business offices located in the original building. Opening on this corridor is a passenger elevator large enough to accommodate stretchers and wheeled carts serving all floors above. In the north end are located the kitchen, the dietitian's office, the special diet kitchen, the special diet and private dining rooms. The kitchen embraces the butcher shop, the vegetable preparation facilities, space for salad preparation, ice-cream and pot-washing rooms, separated from the main kitchen by semi-partitions six feet high. The bakery, the flour storage room, the special diet kitchen, the office, and the dining room are separated from the main kitchen by full-height partitions. There are four small walk-in refrigerators for daily storage, seven reach-in refrigerators for prepared-food storage, and an ice-cream storage and freezing box.

The bakery is equipped with a dough mixer, with an automatic flour elevator, an electric oven, a steam-heated proof box, a gas-fired deep-fat fryer, and other modern equipment required for this service.

The stoves, griddles, and ovens of the diet kitchen and of the main kitchen are gas fired, and the main kitchen has a three-compartment vegetable steamer and four steam-heated kettles.

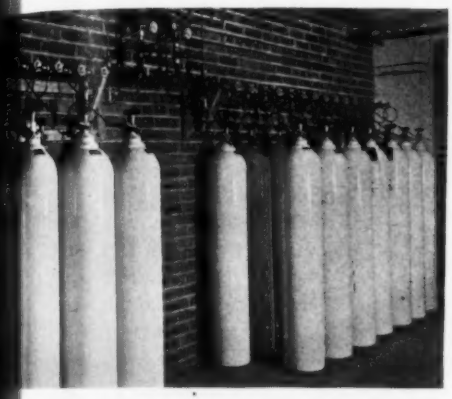
The prepared food is transported to all floors of the entire hospital by means of automatic food-handling equipment having two up-deliveries and one down-delivery, which greatly expedites the serving problem and makes it possible to serve any patient within five minutes after the food is removed from

the steam tables in the kitchen. Each complete meal is served in approximately 25 minutes. The soiled dishes are also transported from the various floors to the basement dishwashing room by this same equipment. In addition, there is also a dumb waiter for between-meal service from the "snack bar" in the kitchen.

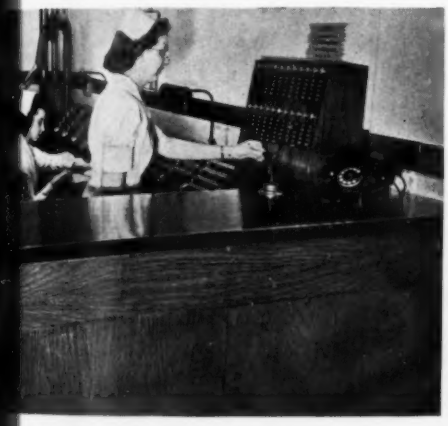
Accommodations for Private Patients

The second, third, and fourth floors provide for private patients' rooms, each with a toilet room while five rooms on each floor have in addition, a full bath.

The corridor is "T" shaped with the nurses' station located at the end of the long corridor at the point at which it crosses the short corridor. Off the short corridor are three patients' rooms, the elevator, the floor supervisor's room, toilet and bathroom, the conference room and the stairway, and at the end a solarium. The opposite end joins the corridor of the original building. Off the long corridor are 14 patients' rooms, the service kitchen, the utility room, toilet and bath, three utility closets, two soiled-linen chutes,

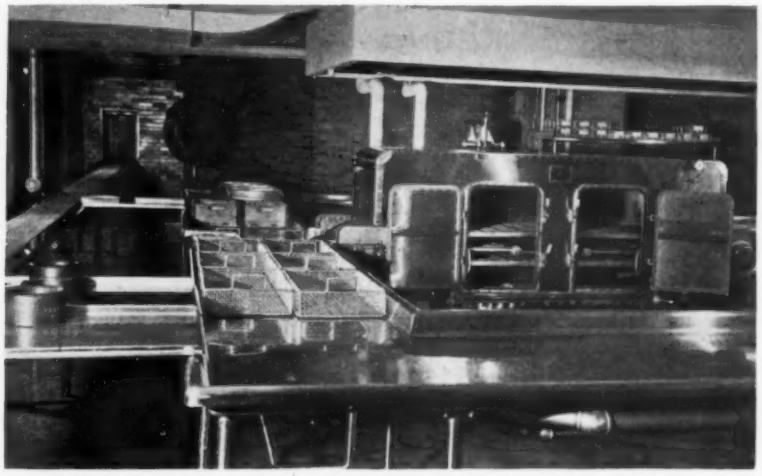


TRAL OXYGEN AND ANESTHESIA SUPPLY ROOM

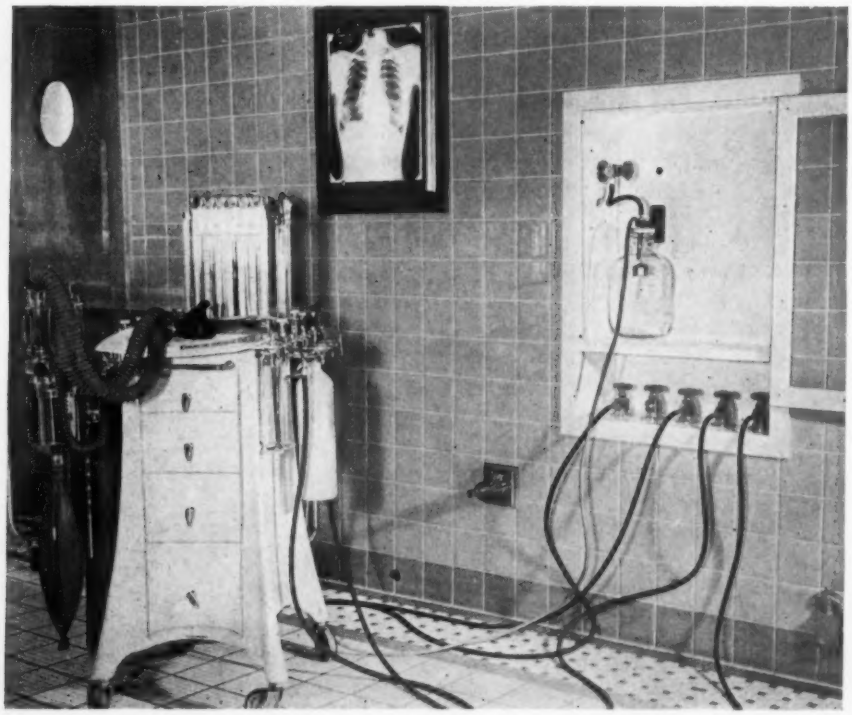


ONE OF THE NURSES' STATIONS

ONE OF THE PATIENTS' ROOMS



CENTRAL DISHWASHING UNIT SEPARATE FROM THE MAIN KITCHEN AND LOCATED IN THE BASEMENT



ANESTHESIA ROOM

ONE OF THE SUN PARLORS

the incinerator, and two additional patients' rooms. Corridors are lighted by fully recessed overhead lights and semirecessed night lights near the floor.

In the nurses' station are located the pneumatic tube system station, the chart desk, the narcotic cabinet, the medicine sink, and desk unit for the combined nurses' call, radio, and inter-communicating system.

Each patient's room is equipped with steel furniture consisting of a crank-operated posture bed, a bedside table, an overbed table, a desk, a dresser, a straight chair, an easy chair, and a footstool. For lighting there is a small 100-watt indirect ceiling light of the "Silvray" type, a three-way adjustable wall bracket over the bed and a direct-indirect bedside floor lamp. Each room has an oxygen outlet connected to oxygen piping system, a nurses' calling outlet of the rubber-covered-cord and push-button type, a telephone outlet, and a wall-mounted combination speaker microphone. Each toilet has a bed pan rinser with hot and cold water. In addition, chilled drinking water is piped to each room.

The utility room is equipped with a sink, a storage cabinet, a gas plate, a bed-pan washer and sterilizer, equipped with five-pan rack and battery mounted 8 by 9 by 18-in. nonpressure instrument sterilizer as well as a pair of ten-gallon water sterilizers.

The service kitchen is provided with a sink and storage cabinet only, since all food is prepared and placed on the individual tray in the kitchen. The trays are removed from the "Subveyer" or dumb waiter in this room and carried (transported by cart to the far corridor of original building) to the patients' room.

Recessed in the corridor wall are a steam-heated blanket warmer, an electrically heated solution cabinet and two drinking fountains with bubbler and glass filler supplied with chilled water.

The Obstetrical Service

The fifth floor is part of the obstetrical department, and on it are included four delivery rooms, one of which has glass enclosed viewing gallery, ten labor rooms, two preparation rooms, the doctors' rooms and showers, expectant fathers' waiting rooms, toilets, a linen room, and the central sterilizing rooms.

The Surgical Service

The sixth floor provides for the surgery including four major operating rooms, four minor operating rooms, two genito-urology rooms, two cast rooms, two pre-anesthesia rooms, the central sterilizing and dental room.

Between each two surgery rooms and delivery rooms are located two scrub-up sinks and fully recessed sterilizing equipment consisting of 16 by 24-in. pressure instrument sterilizer and pair of 10-, 15-, or 25-gal. water sterilizers. Between the two genito-urology rooms the water sterilizers are mounted near the ceiling with direct draw-off connection to each of the two fluoroscopy tables, eliminating the use of overhead irrigator.

The four major operating rooms are equipped with overhead major lights and all other surgery and delivery rooms also have modern surgical lights. All switches, electrical outlets, and foot-operated nurses' calling stations are of explosion proof construction. Recessed in the wall of each of these rooms is a cabinet containing valved outlets for suction, air, nitrous oxide, oxygen, ethylene, and helium, as well as an X-ray viewing cabinet.

The central sterilizing rooms on the fifth and sixth floors each contain two 20 by 48-in. double-end pres-

ONE OF THE NEW CYSTOSCOPIC ROOMS

A DOCTORS' SCRUB-UP ROOM

pedic patients. Provided for this service are private, semiprivate, and ward rooms, accommodating 23 patients, an open-air sun deck, a playroom, a service kitchen, utility rooms, etc.

The Installation of Air Conditioning

The new addition is completely air conditioned both in summer and in winter. This system is ideal for it embodies principles of design quite different from other types of systems in hospital use, because a predetermined fixed quantity of outdoor air is constantly supplied for ventilation; no air is recirculated from one room to any other room; individual room control is noiseless and easily accomplished, draftless air movement is induced in the room.

The outdoor air, called the primary air, is filtered electrically, heated or cooled, humidified or dehumidified, as required, and distributed by a large fan from a central point through small primary air conduits in much the same manner that water is pumped through large pipes. In each room under the window is located a room unit or cabinet which has a duct connection and the primary air is forced at high velocity through

ONE OF THE INSTRUMENT CABINETS

sure instrument sterilizers, two 15-gal. water sterilizers, a 10 by 12 by 22-in. nonpressure instrument sterilizer, a five gallon still, a sink, and gas plate.

The Laboratory Services

The seventh floor is reserved for the laboratory service. Included in this plan is adequate space for postmortem facilities, a mortuary cooler, a museum, the pathologist's office, a secretary's office, the bacteriology kitchen, the bacteriology laboratory, the haemotology laboratory, urinalysis, a medical photography room, space for chemistry and histology, an office for the resident pathologist, the technical library, a clinical conference room, a laboratory supply room, toilets, and other necessary service rooms.

The Orthopedic Service

The eighth floor is set aside for the care of the ortho-

THE POST MORTEM ROOM

a number of nozzles within the unit in such a manner that air from the room is drawn into the unit through the front grille. This air mixes with the primary air

CRIPPLED CHILDREN'S PLAY ROOM

and is discharged through the top grille. As the room air enters the unit, it passes over a coil through which is circulated cold water in summer and hot water in winter to lower or raise the room temperature. The system is used throughout, except in the kitchen, the basement, the surgical, and the delivery rooms. Each of the patient's rooms and similar rooms has a unit through which passes 36 cu. ft. of outdoor air and 144 cu. ft. of room air per minute.

Each of the delivery and operating rooms has a small system complete in itself with automatic controls to maintain the desired temperature and humidity conditions. The control panel for each system is located over the scrub-up sink adjacent to each room. On this panel is a starting switch by which the fan may be operated constantly or intermittently as required by the automatic control and an outdoor air volume switch by which the amount of ventilation air can be varied from none to 100 per cent of outdoor air. As the quantity of the outdoor air is varied so also is the amount of air mechanically exhausted from the room controlled. With these individual room units, no air is recirculated from room to room. All anesthesia fumes and other obnoxious odors or gases can be quickly, positively, and directly removed from any room.

Other Service Features

An emergency lighting system has been installed for all operating, delivery, and emergency rooms. This unit provides uninterrupted light at these important locations through an automatic switch in case of current failure in the normal power service. This emergency electric service is supplied through a battery set kept fully charged automatically at all times.

Compressed air, suction, nitrous oxide, oxygen, ethylene, and helium are piped from the central gas storage room in the subbasement to all operating, delivery, and anesthesia rooms and oxygen is piped to all patients' rooms.

The nurses' call and radio is a combination nurses' calling, radio, and two-way communication system between the patient's room and the nurses' station. A patient's call is registered by the light over the room door, by light and signal in the service kitchen and utility room and by light and signal at the nurses' station desk unit. By operating a switch the nurse may talk or listen to the patient from the desk unit. Also by means of other switches any one of four radio programs can be received by the patient. The radio receiving sets are located at a central station and programs distributed over four channels to each nurses' desk unit, where they can be distributed to the patient's room.

A Technical Manual on the Preservation and Transfusion of Whole Human Blood

Prepared for the Medical Division, U. S. Office of Civilian Defense, Under the Direction of the Sub-Committee on Blood Substitutes of the National Research Council

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PREFACE

THE treatment of severe hemorrhage requires some type of emergency transfusion service in the civilian hospital. The presence of a blood bank provides a depot of stored blood and plasma which is immediately available in the treatment of the victim of the automobile, the patient with gastro-intestinal bleeding, the women with puerperal hemorrhage, and the complications incident to the surgical operation.

The community in which the hospitals are so equipped to cope with the emergencies of civil life will find itself provided with the means of treating air-raid victims, the injured from munitions factories, and the other civilian casualties which may be expected in total war. For, unlike many establishments which are necessary in time of war but become obsolescent as soon as peace is declared, the organization of a blood bank is sufficiently elastic as to be constantly useful. Functioning to supply the normal civilian needs of the hospital, it may be rapidly expanded and diverted to serve practically any local emergency involving bloodshed.

PART I. CLINICAL AND EXPERIMENTAL BACKGROUND

Chapter I. Isohemagglutinins and Isohemolysins (3)

All human beings are divided into four blood groups depending upon the reaction of their bloods with one another. Reduced to its simplest terms, the four types of erythrocytes are determined by the absence or the presence of the two agglutinogens A and B in various combinations. Since a blood group is named from the agglutinogen contained in its cells, the four human blood groups are A, B, AB, and O. The serum or plasma may contain specific agglutinins each of which reacts against only the A or B agglutinogen. The combination of cells containing agglutinogen A with serum or plasma containing anti-A agglutinin will produce permanent clumping or agglutination of the cells. It is obvious, therefore, that no single blood can contain an agglutinogen and its corresponding agglutinin. Group A blood contains anti-B agglutinin. Group B blood possesses anti-A agglutinin. Group O blood contains both anti-A and anti-B, and AB blood contains no agglutinins. About 30 per cent of fresh bloods having agglutinins contain hemolysins which are specific and react against the same agglutinogen as the agglutinin. The hemolysins are weaker in titer than the agglutinins and will only act in the presence of complement. They are therefore not encountered when typing serum is used, but their presence constitutes a potent source of error in the cross-matching of bloods.

The individual inherits the combination of group-specific substances which determines his blood group. It follows that the blood group cannot change during the life of the individual. According to Bernstenin's theory, there are two laws governing the inheritance of blood groups: 1. Agglutinogens A or B do not appear in the blood of the child except when present in one or both of the parents. 2. The combinations, group O parents and AB child, or vice versa, are impossible.

The changes in titer of agglutinins during life are of some importance in the cross-matching and typing of blood. Agglutinogens appear as early as the 37th day of foetal life. The titer increases until the 20th year after which it remains constant. The erythrocytes of a newborn baby are only one fifth as sensitive to agglutination as are those of an adult. There is some doubt as to whether agglutinins are present at birth. At any rate, the titer quickly increases and reaches a maximum between 5 and 10 years, after which there is slow diminution of potency. These facts account for the difficulty sometimes encountered in determining the blood groups of children.

When agglutinin and group-specific substances come in contact, a combination is effected which is permanent and results in the neutralization of the agglutinin. This phenomenon occurs when incompatible agglutinins are injected into the body as plasma or serum, or when group O blood is transfused into a recipient of another group. This fact explains the safety with which pooled plasma is employed (31), but there is still some question as to whether the use of Group O blood as "a universal donor" is entirely innocuous. There are many who believe that the use of the universal donor is without danger and attribute the cases of reactions reported in the literature to some other cause. The Rh factor, for example, has only recently been recognized and the older studies did not consider this possibility. One case has recently been reported, however, where the anti-Rh factor was definitely excluded (27).

The neutralization of the agglutinins outside the body has been made practical by the preparation of the group-specific A and B substances (agglutinogens) by Witebsky et al (49). These substances have been prepared in a form safe for intravenous injection. The addition of a small amount of 500 cc. of group O blood immediately inactivates the anti-A and anti-B agglutinins in the plasma, thus producing a universal blood which ought to be free from theoretical objection.

Recently a new factor has been described as a possible cause of transfusion reactions (30, 47, 48). When rabbits are sensitized with injections of the erythrocytes of Rhesus monkeys, the serum from such rabbits will agglutinate the cells of about 85 per cent of human beings. These human bloods are said to be Rh-positive, and the remaining 15 per cent are designated as Rh-negative. Rh-positiveness is inherited as a mendalian dominant character. The hypothesis has been made that when an Rh-negative individual receives multiple transfusions of Rh-positive blood, an anti-Rh hemolysin may develop which may be strong enough to destroy the transfused blood. Somewhat similarly, when a woman who is Rh-negative bears a foetus which is Rh-positive, she may develop anti-Rh hemolysins which may either result in foetal death or in erythroblastosis foetalis. If she should receive transfusions of Rh-positive blood during pregnancy or the puerperium, such blood might be destroyed by this antibody. All the links in this chain of evidence have not as yet been proved and there are no data available showing the incidence of reactions from the Rh factor. In testing for the presence or absence of Rh factor in cells, human anti-sera should be employed.

Chapter II. The Donor

It is the general practice to accept as blood donors both men and women between the ages of 18 to 60 who assert that they are in good health. Persons giving a history of recent asthma should be rejected but it is not apparently dangerous to transfuse the blood of a donor having pollen sensitivity outside the pollen season. Repeated attacks of angioneurotic edema should disqualify. A history of malaria or a recent chancre (the routine testing of blood by serological reaction will not always disclose the infective stage of syphilis) should be cause for rejection. Physical examination of the donor is usually

very superficial since there are not many asymptomatic conditions in which the donation of blood is contraindicated. Inspection of male genitalia for chancre should be obligatory. The temperature must be taken and the donor is rejected if fever is present. The blood pressure is determined and some reject donors with a systolic tension over 200 mm. of mercury. The reason for this seems to be that if the individual should have a vascular accident it might be ascribed to the donation of blood. A systolic blood pressure less than 100mm. Hg should be cause for rejection. A hemoglobin determination should be performed and individuals with less than 80 per cent of normal for their sex should be rejected.

Recent physiologic studies (21,45) have thrown much light on the readjustments which take place in the body after controlled hemorrhage, such as the donor undergoes. After withdrawing from 500 to 1200 cc. of blood the pulse may either remain normal, be increased, or bradycardia may actually develop. The blood pressure frequently falls to levels of 80 or 90mm. systolic. Some persons show an exaggerated response to changes in posture, the systolic pressure falling instead of rising when the erect position is resumed. This condition may obtain for hours and probably accounts for some of the syncopal attacks which are sometimes encountered when the donor gets off the bleeding table. In bleedings of 500–1200 cc. it takes between 48 and 72 hours for the blood volume to be restored to normal. During this interval there is a steady increase in fluid content of the blood, but for the first 2-hour period the added fluid is extremely poor in protein. Thereafter, the fluid has a protein concentration similar to that of normal plasma.

The hemoglobin regenerates much more slowly. There are some discrepancies between the data of various observers; in one study (23) it took about 50 days for males to regenerate the hemoglobin lost in donating blood for one transfusion; females were slightly slower. This interval was shortened to 35 days by the daily administration of 1 gram of iron and ammonium citrates. It is obvious from these data that the only safe rule to be applied to large numbers of donors who are not carefully supervised is to allow the withdrawal of *not more than 500 cc. of blood every 90 days.*

Chapter III. The Recipient

The principle functions of whole blood transfusion may be classified as follows:

1. Replacement of erythrocytes
   Loss from hemorrhage
   Loss from hemolysis
   Failure of erythropoesis
2. Restoration of blood volume in shock**
3. Replacement of deficient plasma protein**
4. Treatment of infection*
5. Treatment of carbon monoxide poisoning
6. Supplementing prothrombin*
7. Treatment of hemorrhagic diatheses
8. Treatment of burns (early)**
9. Treatment of burns (late)*

There are few contra-indications for blood or plasma transfusion but these should be observed with extreme care. The presence of cardiac decompensation or edema of the lungs should serve as an absolute contra-indication. It has been shown that failure of the left side of the heart may be produced by the intravenous injection of as little as 200 cc. of saline in an individual with borderline compensation (38). In extreme cases edema of the lungs may be produced by the injection of as little as 50 cc. of blood.

Of prime interest in blood transfusion is the time of survival of the transfused erythrocytes in the circulation of the recipient. The data for fresh blood have shown considerable variation due to the different methods employed. In general, comparisons made between fresh and preserved blood are more informative because the same methods have been used throughout. Using the differential agglutination method of Ashby, it has been shown (7) that blood stored in sodium citrate for 8 days survives in the recipient but nearly one half as long as fresh blood. Blood stored in dextrose-citrate solutions survives for much longer periods (7,33,34). When the concentration of dextrose is high, as in the Rous-Turner mixture, 42 per cent of the cells stored for 28 days were present in the circulation 1 month after transfusion (35).

Chapter IV. Transfusion Reactions

It is of the utmost importance to attempt the differentiation of the various types of transfusion reactions, since the etiology of each type is different. It is no more diagnostic to state unqualifiedly that "the patient had a transfusion reaction" than to inform the clinician that his patient had a fever. Transfusion reactions are frequently difficult to differentiate from the manifestations of the original disease. The following categories will be found to include the great majority of transfusion reactions.

Pyrogenic Reactions

Clinical Description: While the transfusion is being received, or soon thereafter, the patient experiences a chill of varying degree. This is usually followed by a rise in temperature of 101° or 102° F. The fever persists for 5 or 6 hours and subsides without treatment. Occasionally there is a definite chill with no elevation of temperature; or, there may be no chill preceding the fever.

Etiology: Certain water-borne bacteria may grow in distilled water and give off soluble ultrafilterable products which are not inactivated by temperatures usually used in sterilization. When these substances are injected intravenously they produce the clinical syndrome described above, and are called pyrogens. Lack of care in the preparation of blood transfusion equipment and of the fluids employed are undoubtedly responsible for most of the pyrogenic reactions accompanying transfusion.

Prophylaxis: Proper preparation of transfusion equipment and fluids for parenteral therapy; avoid contamination.

Treatment: Mild reactions require no treatment. If reactions are severe, the transfusion should be discontinued.

Differential diagnosis: Onset with severe chills and fever with some dyspnoea suggest the possibility of the much graver hemolytic type of reaction. The transfusion should be promptly discontinued and a recheck of the typing and cross matching should be done at once (see hemolytic reaction).

Urticarial Reactions

Clinical description: At any time during the course of the transfusion or immediately afterwards the patient may develop an urticarial eruption which may consist of only a few "hives" or may become generalized. In some individuals the process takes the form of angioneurotic edema where one part of the body becomes massively edematous. The peri-orbital tissue and the lips are most commonly involved in this process. The eruption usually

*These functions may also be accomplished by the transfusion of plasma.
**These functions are *accomplished better* by the transfusion of plasma.

subsides in from six to twenty-four hours. There is some danger that in the severe cases edema of the larynx might develop.

Etiology: Very little insight has been gained into the cause of many of these reactions. It has been observed that the blood from an individual with repeated attacks of angioneurotic edema has produced similar manifestations in recipients. On the other hand, in many instances neither donor nor recipient gives a history of allergic manifestations. A recipient may react to a certain blood with the first injection and not with subsequent injections. The same blood may produce urticaria in one individual and not in another.

Prophylaxis: A small proportion of reactions may be prevented by disqualifying donors who are subject to angioneurotic edema. The use of blood from fasting donors will tend to diminish this type of reaction.

Treatment: With minor degrees of eruption, the transfusion may be continued, but severe manifestations require discontinuance. The drug of choice is epinephrin hydrochloride, 0.5 cc. (1–1000 solution) subcutaneously.

Differential diagnosis: This offers no difficulty.

Hemolytic Reactions

Clinical description: A distinction must be made between the symptoms following the intravenous injection of free hemoglobin and the symptoms occurring after intravascular hemolysis. This probably is largely a matter of dosage, since it is possible to release much greater amounts of free hemoglobin by the rupture of cells already in the circulation than can be introduced through a needle in unit time. The intravenous injection of small amounts of hemoglobin causes no symptoms, but when large amounts are given the patient complains of a feeling of constriction behind the sternum, chilliness, fever and pain in the lumbar region (24). The symptoms are similar when slight degrees of hemolysis have occurred intravascularly. When red-cell destruction has been more extensive, the patient may go into shock, with cold, clammy skin, lowered arterial tension, and air hunger. Death may occur at this stage if proper treatment for shock is not immediately instituted. If shock does not appear, or is successfully overcome, another manifestation to be expected is jaundice. This has been observed within six hours after the accident. Blood bilirubin values of from 10–20 mgm. per cent are not uncommon. The blood serum is colored red by free hemoglobin from only a few hours to several days. The urine may contain sufficient hemoglobin to appear bright red. On standing it becomes brown. The hemoglobinuria may disappear within 48 hours and recovery be uneventful. The jaundice fades within a few days. In the exceptional case, however, oliguria or anuria develops, usually during the first 24 hours. This results in the retention of nitrogen, the blood urea nitrogen frequently doubling each day over the value of the preceding day. The lowering of the alkali reserve due to the development of acidosis is a characteristic feature. Coma supervenes during the last few days of life. Death usually results on the fourth to nineteenth day after transfusion unless spontaneous diuresis occurs, in which case complete recovery is the rule. Hypertension may develop. At autopsy, there are no gross lesions except some edema of the parenchyma of the kidneys. Microscopically there is interstitial edema of the kidneys with little or much tubular necrosis. Some evidence of tubular regeneration may be seen in an increased number of mitotic figures. The glomerular tufts are normal and the lumina of the proximal convoluted tubules are usually dilated. The distal convoluted tubules may contain pus cells, cellular debris, and a few casts of yellowish brown pigment, which is thought to be hemoglobin. The interstitial tissue is frequently infiltrated with polymorphonuclear leukocytes. In some cases there are focal necrocoses of the liver (9, 10, 11, 12, 26)

Etiology: The cause of the hemolysis should be the first consideration. The blood may have been hemolyzed before injection into the body as a result of improper storage, freezing, application of excessive heat, or the addition of distilled water or other hemolytic agents. The most common cause of intravascular hemolysis is the transfusion of incompatible blood. Intravascular hemolysis may occur spontaneously in malaria, paroxysmal hemoglobinuria, idiosyncrasy to quinine, and patients with anti-Rh factor.

There is a renal threshold for hemoglobin (24, 39). In normal kidneys hemoglobin appears in the urine when the plasma level reaches about 135 mg. per 100 cc. The threshold is lower in damaged kidneys. Empirically, it has proved a safe rule that injections of free hemoglobin insufficient to exceed the renal threshold are innocuous.

Prophylaxis: The prevention of hemolysis lies in an understanding and avoidance of the factors causing it, as outlined under etiology. The result of some animal studies (10, 11) would suggest that routine alkanization of the urine before transfusion might prevent transfusion anuria. This, however, is not at all certain.

Treatment: If the patient with a hemolytic reaction develops neither shock nor anuria, recovery is spontaneous and no treatment is necessary. If shock develops, prompt transfusion with plasma may be indicated. The oral administration of alkalis may be tried.

Differential diagnosis: It is important to recognize hemolytic transfusion reactions as soon as possible. If the patient is seen within a few hours after receiving the transfusion, a specimen of his blood should be immediately withdrawn in dry, clean apparatus and centrifuged. The absence of hemoglobin in the supernatant fluid will exclude severe hemolysis. In the examination of the urine it is important to differentiate between hematuria and hemoglobinuria. Hematuria is not recognized as a complication of blood transfusion.

Circulatory Embarrassment

Clinical description: During, or immediately after transfusion, the recipient suddenly becomes extremely dyspnoeic and cyanotic, and it is evident that he is dangerously ill. The lungs are full of fine crackling and course rales. The patient may recover spontaneously or die within one half to six hours. At autopsy the lungs are edematous and the left auricle is dilated.

Etiology: It is now recognized that even small increases in the blood volume of patients with borderline cardiac compensation may result in left ventricular failure. The cases of frank cardiac decompensation are usually easily recognized and are not transfused. It is in the unrecognized borderline cases where transfusions are most likely to produce circulatory embarrassment. Death has been reported (12) from the injection of 200 cc. of blood into the adult recipient. It is thought that patients having other diseases (e.g., uremia) causing pulmonary edema are also likely to have this type of reaction.

Prophylaxis: This rests entirely on the clinical acumen in diagnosing the original disease.

Treatment: As soon as the condition is recognized, transfusion should be discontinued and phlebotomy should be performed. Tourniquets may be placed on all four extremities with sufficient pressure to cause venous

stasis, but for not longer than 15 minutes.

Differential diagnosis: This offers no difficulty if the possible development of cardiac failure be kept in mind.

Retinal Hemorrhages

It is thought by many that retinal hemorrhages may be the result of transfusion and occasionally they are observed to appear during or shortly after this procedure. It is notable, however, that they are seen mostly in patients with blood dyscrasias or capillary damage.

Infections Transmissible by Transfusion

Malaria and syphilis have many times been transmitted by the transfusion of whole blood. Prophylaxis and treatment are both obvious. It should be noted, however, that a negative serological reaction does not necessarily insure against transfusion syphilis. Several cases are on record in which syphilis was transmitted by the blood of a donor drawn after the initial infection, but before the serological reaction had become positive. Recent work (44) has shown that the Treponema pallidum will not survive over 96 hours in preserved blood. The utilization of this fact would probably eliminate transfusion syphilis. The viability of the malarial parasite in preserved whole blood (25) is much longer but the figures of different observers vary considerably.

Toxicity of Potassium

When the fact became known that potassium diffused into the plasma from the erythrocytes during storage, it was feared that the high potassium content might prove toxic in transfusion (40). No evidence of poisoning by potassium has, however, ever been observed (16).

Transfusions of Cold Solutions

It was formerly considered necessary to warm blood or other fluids before intravenous administration. This practice not only resulted in the loss of valuable time and required the use of special equipment, but it was also potentially dangerous in the case of blood transfusion. There is at least one fatality reported (5) from the injudicious application of heat to the blood during a transfusion. It has been shown that fluids may be injected into the vein at relatively low temperatures (60 deg. F.) without reaction (17). This means that blood or plasma may be taken from the refrigerator at 35 deg. to 38 deg. F. and used at once, since a temperature of about 60 deg. F. will be attained by the time the solution reaches the recipients' vein after passing through the intravenous set. This fact is exceedingly useful in the transfusion of preserved blood or plasma in emergencies since it allows all possible haste.

Incidence of Transfusion Reactions

The following statistics give the incidence of transfusion reactions in one study (19). In 2493 transfusions there were 22 (0.9 per cent) accompanied by chills but no fever, 40 (1.6 per cent) with chills and fever, 28 (1.1 per cent) with urticaria. There was one death from cardiac embarrassment and another fatality from the use of incompatible blood.

Chapter V. Changes in Blood During Storage

Spontaneous hemolysis begins in minute degree as soon as blood is collected. When it is stored at 2-5 deg. C. hemolysis proceeds at rates depending upon the preservative mixture employed (13, 14, 36, 37). If citrated blood be taken as a standard of reference, the addition of electrolytes, such as sodium chloride, accelerates hemolysis. The addition of dextrose definitely inhibits the rate of destruction of the red cells. The mode of action of the dextrose is not known but it has been demonstrated that to secure optimum effect, a concentration of about 3 per cent of that sugar must be attained in the blood mixture. With such conditions, there is less than one half as much hemolysis in 30 days of storage as occurs in citrated blood at 10 days. Isotonic concentrations of solutions should be used in the preservative mixtures. When hypertonic solutions are employed, the contents of the erythrocytes become hypertonic during storage so that they may be ruptured when they come in contact with the plasma of the recipient. There is slightly less spontaneous hemolysis when blood is stored in a container from which all the air is displaced by the blood mixture. It has been repeatedly demonstrated (20) that human blood withstands very well the shaking incident to transportation over great distances if the containers are full. Red cells stored in dextrose-citrate mixtures persist longer in the circulation of the recipient than do erythrocytes stored in citrate alone (35).

The leukocytes lose viability extremely rapidly during storage, very few surviving the fourth day (8). This seems to be independent of the preservative employed. The platelets are even more evanescent (6), disintegrating within a few hours.

The plasma proteins are relatively stable (41) and are not denatured to any significant extent. The prothrombin of the plasma disintegrates slowly during storage at refrigerator temperatures, being about 70 per cent of normal at 21 days and about 30 per cent in 30 days (32, 46, 50). It should, however, be emphasized that the prothrombin is only one factor in the clotting mechanism and that blood one month old will clot promptly when recalcified.

Normally the human red cells contain about 20 times as much potassium as does the plasma, while the latter contains sodium to the exclusion of the cells. During storage the red cells lose much of their potassium to the plasma and sodium diffuses into the cells. This process attains its maximum in about 15 days (15), producing a plasma with a relatively high concentration of potassium.

Some study of the rate of loss of complement and antibacterial substances has been made and the reader is referred to the original articles for details (28, 29).

PART II. TECHNIQUE

Chapter VI. Operation of a Blood Bank

The advantages of a blood bank are primarily three:

1. The instant availability of blood or plasma in emergencies;
2. The privilege extended to gratuitous donors of trading their blood for that of the proper type in the bank;
3. Economy to hospital and patients.

Each bank is modified to suit local conditions and an organization which is admirable for one set of circumstances would not fit another. An attempt will be made to outline the principal variations and to indicate some of the advantages of each.

Types of Blood Banks

1. *Complete blood and plasma bank:* This type of organization is suitable for the hospital having over 25–30 transfusions per week. Donors of all types are accepted as the laws of chance present them. The bloods are kept as whole blood until the limit of storage is attained (determined by the preservative mixture used). If the whole blood reaches the out-dating period without

being called for, the supernatant plasma is then recovered by aspiration from the cell layer and the red cells are discarded. This citrated plasma may be kept in the refrigerator or at room temperature in the liquid state or under certain conditions it may be frozen. Proof of sterility is required before it may be administered. If the transfusion service is large, the turnover of bloods will be relatively rapid and there will be few which are ultimately converted into plasma, unless an excess is collected. Where the service is small, the amount of plasma accumulated will be correspondingly increased.

2. *Blood banks with limited blood types:* It is the usual experience that most of the out-dated bloods in a bank belong to the rarer types B (10 per cent of population) and AB (5 per cent). Since the incidence of group A in the population is about 40 per cent and that of group O is 45 per cent, a blood bank accepting only those two groups could use 85 per cent of the donors presenting themselves. Group O bloods could be given to the recipients of all groups and group A bloods could be given to groups A and AB. Such an arrangement would merely require the determination of the donor's group before the blood is drawn. This type of a bank will operate successfully for hospitals with smaller transfusion requirements than 25–30 per week.

3. *Bank employing group O blood only:* A satisfactory blood bank may be operated for the small hospitals by the use of only group O blood. If these are treated with the group specific A and B substances (see page 3), they become "truly universal donor" bloods and can be used more safely than untreated group O blood. This is probably the most satisfactory type of blood bank for the very small hospital.

4. *Plasma bank:* When no attempt is made to store and use whole blood because the transfusion service is too small to make it feasible, blood may be collected at irregular intervals, regardless of type, and the plasma separated from the cells either by sedimentation or centrifugation. The plasma is kept purely for the emergency treatment of shock from hemorrhage, the treatment of the dehydration and shock accompanying severe burns, and for the treatment of other conditions as previously discussed. In the treatment of shock due to hemorrhage the plasma is usually employed as an emergency measure until a suitable blood donor can be found. There is no limit on the smallness of the plasma bank, but the overhead cost increases and could become prohibitive for each unit of plasma processed.

Methods of Accounting

Several methods have been devised by which the accounts of the bank may be kept. In the large hospital where the medical specialties are organized into services, it may be convenient to carry an account in the bank for each department. When a donor is sent in from a particular service, the account carries a credit of blood in cubic centimeters. When a patient on that service receives a transfusion from the bank the account is debited by the amount of blood given. This system possesses the convenience of having to deal with perhaps one house officer on each service who in turn guards the interest of his service by supervising the interns in the procurement of donors. Although donations are requested on the basis of transfusions given to patients in whom the donors are interested, it frequently happens that a surplus of blood accumulates in the bank. With service accounts, the occasional patients requiring transfusion but unable to procure donors may be served from the departmental surplus. This is extremely hard to manage under any other type of an accounting system.

In the smaller hospital it may be desirable to have each intern carry an account in the bank. When he procures a donor he receives credit for the volume of blood which he may then transfuse into one of his patients. Or, the individual physician or the individual patient may have to be credited and debited with blood as the local conditions suggest. Many variations of the above scheme are possible.

Acquisition of "Capital" for the Bank

After the blood bank is established the bloods are collected and dispensed on some definite trading arrangement, but it is necessary to have a stock of bloods with which to initiate operations. The most practical method for the small community hospital is for the members of service clubs, lodges, or churches to contribute blood with which to begin the bank. The practice has been widely adopted and has proved popular. It can be explained that it is a community enterprise and that the mere existence of such a bank is a form of protection for the members of the community.

Personnel of Blood Bank

It is essential that the blood bank be in charge of a laboratory worker who is thoroughly familiar with all the procedures in the typing and cross-matching of blood and is capable of carrying out aseptic technique in the collection of blood and in the processing of plasma. The amount of the technician's time consumed by the operation of a blood and plasma bank will, of course, depend upon the magnitude of operations. It is excellent policy to restrict to a minimum the number of persons responsible for handling the blood. The cross-matching and typing should be done only by the experienced laboratory technician. These important procedures have not been well handled when made the responsibility of the interns.

Source of Pyrogen-Free Fluids

Before attemping to establish a blood or plasma bank one should be satisfied that there is a source of pyrogen-free fluids available in the hospital with which to prepare equipment for intravenous use. The lack of this precaution will tend to discredit operation of the entire bank, since it is the common inclination to ascribe pyrogenic reactions to the blood and plasma rather than to improperly prepared equipment. Most small hospitals very properly employ commercially prepared parenteral fluids which are pyrogen-free. The commercial firms unfortunately cannot control the preparation of the equipment used to give their solutions, and this is frequently the source of pyrogenic reactions. A thorough understanding of the preparation of the equipment and centralization of its preparation in one place is the *sine qua non* of a proper transfusion service.

Equipment for a Blood Bank

Probably the most expensive item required for the operation of the blood bank is a mechanical refrigerator. For small banks a standard domestic model of an electric or gas refrigerator is satisfactory. Most models have thermostats which are adequate to control the temperature between 2-5 deg. C. A continuously recording thermometer is advisable. If a stock of whole blood is to be kept on hand, consideration should be given to substitute arrangements while the refrigerator is being periodically defrosted. A centrifuge is necessary for the cross-match-

ing and typing of blood; this may be a relatively small, electrically driven, angle type. If it is desired to separate plasma from erythrocytes by centrifugation in the processing of the plasma, a larger, more expensive type of centrifuge is required with the proper accessories. A laboratory microscope will be used in the compatibility tests. Microscope slides, serologic type of test tubes, medicine droppers, and other laboratory accessories will be required. Facilities for steam and dry-heat sterilization will, of course, be necessary. There is a great variety of transfusion apparatus available, and standard acceptable equipment should be employed. The advantages are great of equipment designed to collect blood and process plasma in a completely "closed system" of the type, provided by commercially available vacuum bottles. Completely closed systems are difficult to improvise from ordinary laboratory equipment. If the plasma is to be kept in the frozen state, a small commercial freezing unit maintaining temperatures below —10 deg. C. will be required. These are ordinarily employed for the storage of ice cream in retail establishments.

It is desirable to have a suite of at least two adjoining rooms in which to conduct the procedures of the blood bank. One room should be reserved for the collection of blood from the donors. This can be divided into several cubicles, each containing an examining table and a small side table. The examining tables should be fitted with arm rests. The side tables should contain iodine, alcohol, sterile gauze, adhesive tape and tourniquets. A sphygmomanometer makes an excellent tourniquet. The other room should be fitted for laboratory procedures, the keeping of records, and the refrigerator may be conveniently placed there. If the donors must wait their turns it is desirable to have a waiting room where they cannot overlook the operations of the blood bank while anticipating the donation of the blood.

Chapter VII. Typing and Cross-Matching of Blood

There is no laboratory procedure in which the results of erroneous technique or interpretation are so disastrous as in the typing and cross-matching of blood. The direct result of a mistake may be fatal. For this reason it is extremely desirable that these procedures be in the hands of an experienced individual. Most physicians have not troubled to obtain the information nor the experience to be trusted with these tests. The printed directions for carrying out these procedures are deceptively simple and give a false sense of security. Many transfusion deaths are unrecognized and many more may be purposely ignored.

Determination of Blood Group (Typing)

Use of potent typing sera: Since the diagnosis of the blood group is made on the basis of the presence or absence of agglutination, it is of utmost importance that the typing serum should be of high titer so that false negative reactions do not occur. Typing serum may be made by drawing blood from an individual of known type A or B and titrating the potency of the serum. The serum should agglutinate the cells to which it contains antibodies in a dilution of at least 1:20 and preferably higher. Dependable, high titer testing sera may be purchased from reputable biologic laboratories.

Group reactions with typing sera: The following are the reactions of the cells of the various groups when in combination with the typing sera. The use of the serum from group O blood is an additional check on the test since agglutination by that serum and not by the others should direct attention to some failure in technique or serum potency.

SERA

Cells	*anti-B (From group A blood)*	*anti-A (From group B blood)*	*anti-A&B (From group O blood)*
AB	+	+	+
A	O	+	+
B	+	O	+
O	O	O	O

+ = agglutination
O = no agglutination

Hanging-drop method: This is only mentioned here to condemn it. It is time consuming when results are urgently desired and it is the least accurate of the methods in vogue. Most of the objection lies in the fact that it is practically impossible to mix satisfactorily cell suspension and serum on a cover slip, without considerable experience.

Centrifuge method of Landsteiner: This is accurate and quick but requires a fairly fast centrifuge. A small angle-type of electrically driven centrifuge is satisfactory. Small serologic type of test tubes are employed; they should not exceed 13 x 100mm. and should, of course, fit the centrifuge cups.

1. Make a *cell suspension* by adding a few drops of unknown blood to a tube of physiologic saline solution. The resulting solution should be turbid and have a faint red color. Practice only will determine the proper proportions. The blood may be obtained from a prick of the skin, or from a venous specimen taken for cross-matching, or may be aspirated from a fresh clot with a dry medicine dropper.

2. *Two drops of cell suspension* are added to each of three clean tubes labeled "anti-A," "anti-B," and "anti-A&B" respectively. *Two drops of physiologic saline* solution are then added to each of the three tubes. Finally, *two drops of specific* typing serum are added to the tubes with the corresponding labels. All of these transfers may be accomplished with clean, and dry medicine droppers.

3. The tubes are then *shaken by hand* several times until the elements are thoroughly mixed.

4. The tubes are then *centrifuged for one to three minutes* until the cells have been thrown to the bottom of the tubes.

5. The tubes are then *inspected for hemolysis* in the supernatant layer. In dealing with preserved bloods with some initial hemolysis, this part of the test is, of course, not informative.

6. The tubes are then immediately shaken by hand so that the *sedimented cells are resuspended.* Agglutination is usually evident to the unaided eye as gross clumping.

7. Drops of the mixtures are then placed on a microscope slide *and inspected with the microscope* under the low-power objective. This is a valuable check on the macroscopic reading. By this means rouleaux formation may often be differentiated from true agglutination. Minimal amounts of agglutination are only detected in this manner.

Open slide method of Vincent: This is an accurate method which consumes more time than the centrifuge method, but does not involve the use of that instrument.

1. *The cell suspension* is made up as in the preceding.

2. A clean microscope slide is divided into thirds by two wax pencil marks. Each space is labeled as to typing serum to be used.

3. *A drop of cell suspension* is placed in each compartment of the slide.

4. *A drop of the appropriate typing serum is added* to each drop of cell suspension.

5. The cells and serum are then mixed by *tilting the slide from side to side continuously for 12 minutes.* The slide is held so that the observer looks through the mixtures at a dark background, the illumination impinging upon the suspension at an angle from above the slide. Another mode of illumination is to have a rather dim light shining through a ground glass from below. Agglutination may be seen with the unaided eye and the growth of the clumps can be traced. When a strong hemolysin is present, the clumps may be seen to disappear.

6. The slide is then *inspected under the low-power objective* of the microscope as an added check.

Desiccated serum method: Certain biologic laboratories have developed a commercially available rabbit anti-serum which is dried and stored in a tightly stoppered tube containing calcium chloride as a dehydrating agent. The serum will retain its potency almost indefinitely in the dry state so that this preparation offers great convenience where typing serum is only occasionally in demand. Since the powdered serum is hydrophilic there is a tendency to take up water from the air if the stopper is removed from the vial for long.

1. The cell suspension is made by adding one drop of blood from a skin puncture to 9 drops of physiologic saline solution.

2. A drop of the cell suspension is placed on each end of a microscope slide.

3. The appropriate powdered serum is conveyed to the cell suspension by means of a toothpick. The amount of powder used is roughly equivalent to a mound held on the broad end of a toothpick and extending about 2mm. from the end.

4. The agglutination is said to be visible to the unaided eye in about 30 seconds. Longer periods of observation than this are advised.

Concentrated human globulin method: Thalhimer and Myron (43) have recently devised a method of concentrating the agglutinins in human sera by chemical separation of the globulin which is then purified and redissolved in concentrations higher than originally occurring in the serum. There is a further advantage in that the tests may be performed on a card, and, when dry and properly labeled, they become a permanent record of the test. The globulin may be kept in the dried form also.

1. Place drops of anti-A and anti-B serum on a card so that their diameters are about 5mm.

2. The subject's finger is then punctured and a drop of blood about 2.5mm. in diameter is placed adjacent to the drop of serum.

3. The blood and serum are then mixed with a clean toothpick spreading the circle to a diameter of about 15mm. The card is rotated slowly "until maximum agglutination has occurred." The exact time is not stated but this is usually less than one minute if the sera are potent.

4. Macroscopic agglutination may be clearly seen against the white card. The drops are then allowed to dry upon the card and it may be filed away. The test may also be performed on microscope slides. Differentiation between true agglutination and rouleaux formation on the card sometimes gives difficulty.

Compatibility Tests (Cross-Matching)

It is not sufficient to know that the prospective donor and recipient belong to the same blood group. They may have different subgroups of A or AB which may be mutually incompatible. Typing will not show up these differences whereas cross-matching does. The cross-matching also serves as a check on the determination of the blood groups. For these reasons, cross-matching is always required.

Cross-matching consists in combining the cells of the prospective donor with the serum of the recipient and vice versa:

Major match = donor's cells + recipient's serum
Minor match = recipient's cells + donor's serum

These tests may be effected by utilizing the centrifuge method or the Vincent open slide method described above. Instead of employing the typing serum, the serum of the donor, or the recipient, is substituted as the case may be. While the major match is the more important as a compatibility test for blood transfusion, performance of the minor match is an added check on the blood typing. Where the recipient is a pregnant woman and an anti-Rh hemolysis is suspected, it is necessary to incubate the tubes containing the mixture of cells and serum at 37 deg. C. for an hour before centrifugation.

In cross-matching one must be constantly on guard for the presence of a hemolysin. (These are not encountered in typing sera). Some of the most serious errors are made because it is not realized that agglutination may be missed if not examined promptly and when the observer sees only a few discrete cells left he may conclude that the combination is compatible.

Sources of Error in Typing and Cross-Matching

False negative reactions are most often due to the following:

1. weak titer of sera
2. insufficient time of observation of test
3. cell suspensions too heavy (the agglutinins may be absorbed by excess of cells)
4. low sensitivity of agglutinogens
   in children
   the A agglutinogen in AB blood
   the cells of stored blood
5. the presence of a powerful hemolysin (cell clumps quickly hemolyzed)
6. errors in labeling
7. erroneous recombination of cells and serum from the same blood in cross-matching

False positive reactions are usually due to the following:

1. rouleaux formation (can usually be differentiated by microscopic appearance; in case of doubt, dilute with saline: rouleaux will break up, true agglutination will not)
2. "cold agglutination" due to agglutinins which react only in cold; very few react at room temperature and none at 37 deg. C.
3. contaminated sera
4. panagglutination may occur in certain diseases (test cells against group AB serum)
5. autoagglutination (test cells against serum of same blood)
6. false agglutination of blood from umbilical cord

Chapter VIII. Collection of Blood

The inexperienced blood donor must be treated with due regard for the psychological state which he may possess when he presents himself at the blood bank. Through the immense amount of newspaper and magazine publicity which has been released in the last five years, the average layman is already acquainted with the facts of the four blood groups and the question of incompatibility of bloods in transfusions. He has also been thoroughly instructed on the operation of blood banks. If he has never actually given blood, however, he may have a certain apprehension which easily can be

enhanced to the point where it is disabling if he is made to wait too long before the operation of bleeding is actually performed, or if he is carelessly allowed a glimpse of a flask of blood or an intimate view of the blood-letting of the preceding donor. A certain tact in meeting the prospective donor and a promptness in dealing with him will avoid considerable distress to him and embarrassing delay or failure for the operator.

It is a moot question whether to require the donor to sign a release stating that he has been fully informed as to the uses to be made of his blood and that he agrees to the arrangement. Legal opinion is not agreed as to the value of such a document or as to its necessity. Many administrators prefer not to request a written agreement, believing that this only accentuates the importance of the procedure in the eyes of the donor. However, it is the usual practice at present to require such a release.

The donor is questioned concerning the time of his last meal (it is desirable to collect blood not earlier than four hours after the preceding ingestion of food). His statement is taken that he is in good health. The history of allergy, malaria, and syphilis is investigated. The hemoglobin is determined, the blood pressure measured, and the temperature taken. The donor's arms are inspected to find the vein most suitable for puncture. The donor is then requested to lie on the table with the selected arm on the support provided. A tourniquet is then placed around the arm above the elbow. A sphygmomanometer is excellent for the purpose and causes less discomfort to the donor since it can be inflated to 40–60mm. Hg. which is below the diastolic tension, but is ample to occlude the venous return. The antecubital fossa is prepared with tincture of iodine, and alcohol. The best vein is selected and the skin over the vein infiltrated with a bleb of local anesthetic solution intracutaneously.

If a commercial vacuum apparatus is employed, the closure of the evacuated flask containing the anticoagulant is uncovered aseptically and the needle of the special donor valve is inserted through the closure, the valve being completely closed. A 15-, 16-, or 17-gauge needle is then inserted in the donor's vein and as soon as it is evident that this has been accomplished the donor valve is opened gradually, allowing the vacuum in the flask to give the proper rate of flow of blood. The flask may be held in any position and is gently moved so that the contents are set in rotation, thoroughly mixing the blood with the preservative mixture. In the meantime, the donor has been instructed to open and close his fist slowly and repeatedly to aid the flow of blood. When sufficient blood has been collected, the donor valve is closed, the tourniquet is released, the needle is withdrawn from the donor's vein while the pressure of a gauze sponge is placed upon the site of the puncture, and the donor is requested to open the hand and elevate the arm.

The donor valve is now withdrawn from the closure of the flask and the blood in the rubber tubing is utilized as follows: Two or three drops of blood are allowed to flow into a small test tube containing 3 to 5 cc. of the preservative mixture being used, and the remainder is drained into a serology tube. Before the latter is used for the serological tests, two or three capillary pipettes (drawn from glass tubing) are filled with serum, sealed, and placed in the tube containing the cell suspension. This is now clearly marked and attached to the flask of blood as the "pilot tube," to be used later for typing and cross-matching. A pressure bandage is placed on the ante-cubital fossa of the donor for a few hours. The flask of blood mixture should be appropriately labeled and placed promptly in the refrigerator.

When the 3 per cent dextrose is used in a preservative solution (as described by DeGowin) the collecting flask and contents should be ice-cold before the blood is drawn into it (14). This procedure is extremely important to obviate extensive hemolysis from the diffusion of dextrose into erythrocytes. When outside temperatures are high, the procedure is also advised when collecting citrated blood.

If the donor is experienced, he may be allowed to leave the room almost immediately although his systolic blood pressure may be considerably lowered as a result of the controlled hemorrhage. Unpleasant symptoms may be expected by a certain number of the inexperienced donors. They feel well until they attempt to resume the erect position, when extreme pallor develops, sometimes followed by syncope. The pulse is frequently slow. Occasionally, there is nausea and vomiting. A rest of 30 minutes in the horizontal position will prevent these symptoms in most, but not in all. The administration of ice water, hot tea, coffee, or bouillon, or whisky is frequently used after the blood letting. A few individuals seem to retain for some hours a tendency to lowered systolic blood pressure when the erect position is assumed. Accidents have occurred where donors have been released after a 30 minute period of observation. There is some danger that the donor may leave the range of observation and develop syncope with resulting injuries such as skull fracture. Two other types of reaction have been noted rarely in large series of bleedings. The donor may develop transitory, generalized convulsions during the collection of blood. Another rare type of reaction is the occurrence of tetany with carpo-pedal spasm and a positive Chvostek's sign.

Chapter IX. Storage of Blood

The whole blood is stored in the refrigerator with temperatures usually ranging between 2–5 deg. C.* A little latitude may be allowed in the upper limit of temperature but reduction below 0 deg. C. will, of course, result in hemolysis. The blood flasks should be shielded from direct sunlight since most of the rays of the spectrum exert some hemolytic effect.

Within 24–48 hours the erythrocytes have settled considerably and the cell layer is covered by a thin, gray layer termed the "buffy coat." This consists of leukocytes, platelets, and debris. Above this is the supernatant layer of plasma. This varies in color and turbidity in different bloods. The presence of lipemia is insignificant but imparts to the plasma a uniform cloudiness which is quite characteristic. Increase in turbidity over a period of a few days is an indication for culture. In the course of 5–10 days of storage, citrated plasma develops a heavy cloud which has been variously called fibrin, fibrinogen, and gamma globulin. This is not noted, or is very slight, in plasmas diluted with dextrose or with saline. As hemolysis proceeds, a layer of free hemoglobin diffuses upward through the plasma, coloring it red. *The rate of this hemolysis depends on the preservative mixture employed.*

The following preservatives are recommended for specific purposes with their limitations stipulated:

Blood-Citrate

Composition:

500 cc. blood
70 cc. 2.5 per cent or 50 cc. of 4 per cent sodium citrate solution.

Recommended purposes:

1. For storage as whole blood for 5 days during which it may be used for whole blood transfusions.
2. For conversion to plasma by centrifugation within 48 hours after collection.

*See Appendix J in the Manual on Citrated Normal Human Plasma.

Limitations:

1. Inferior for storage of whole blood since it does not inhibit hemolysis.

2. There is not sufficient dilution to allow recovery of plasma economically by sedimentation.

Blood-Saline-Dextrose-Citrate (Alsever and Ainslie) (4)

Composition:

500 cc. blood
500 cc. solution containing
9.33 Gm. dextrose (2 per cent)
2.09 Gm. sodium chloride
2.83 Gm. sodium citrate (dihydric)

Purposes recommended by the authors:

1. For the storage of whole blood suitable for transfusion for 21 days.

2. For conversion to plasma by aspiration of the supernatant dilute plasma after 16 days of sedimentation or after the whole blood has been outdated. The plasma thus removed remains relatively free from precipitate as compared to the more concentrated liquid plasmas.

Limitations:

1. The bulk might be considered disadvantageous for some purposes.

Blood-Dextrose-Citrate (DeGowin, Harris, and Plass) (13, 14)

Composition:

500 cc. blood
650 cc. 5.4 per cent dextrose in distilled water
100 cc. 3.2 per cent sodium citrate (dihydric) in water.

Purposes recommended by the authors:

1. For the storage of whole blood suitable for transfusion for 30 days.

2. For the transportation of whole blood over long distances. This mixture fills one type of commercial flask with displacement of practically all of the air, permitting a minimal amount of shaking and an optimal carbon dioxide tension for preservation.

3. For conversion to plasma of the outdated blood by the aspiration of the supernatant dilute plasma.

Limitations:

1. The bulk might be considered disadvantageous for some purposes.

2. When blood is collected in this mixture it should be chilled by having the flask and preservative cold.

Chapter X. Transportation of Blood

It has already been noted that the shaking incident to transportation has little effect on human erythrocytes. When preserved whole blood is contained in flasks with watertight closures it may be transported most easily by immersing the flasks in ice water. The water-ice mixture will maintain an even temperature as long as unmelted ice is present. The ice may be replenished as often as necessary in the course of the trip. A 10-gal. milk can will accommodate 10 of the commercial flasks referred to above and sufficient cracked ice to maintain low temperatures for nearly 24 hours during summer heat, provided an insulated shipping jacket is employed (20). Special precautions are necessary if dry ice (carbon dioxide) is used since there is danger of freezing the blood. When water-ice mixtures are used, care should be taken not to lower the freezing point by the addition of sodium chloride, sugar, or other substances. Waterproof labels must, of course, be provided if the flasks are to be immersed in water. This type of refrigeration can be used as an emergency measure when the mechanical refrigeration of the hospital fails.

Chapter XI. Administration of Blood

When a transfusion is required the blood group of the recipient is determined and his blood is cross-matched with a blood of suitable group in the bank. The specimen in the "pilot tube" is used for this purpose.

Two problems of equipment are particularly involved in the administration of preserved blood; a device for the initiation of the transfusion, and a filter for the blood. The initiation of the injection of blood presents the problem of excluding the donor's blood from the needle until the backflow of recipient's blood indicates that the needle is in the vein. Several types of procedures are used to accomplish this. The needle may be attached originally to a Luer syringe which is detached after receiving the backflow, the needle is then attached to the line of flow by an adapter. Another method is by the use of a Kaufmann side-arm Luer syringe. The backflow is then pulled into the barrel of the syringe up to the side arm where the donor blood then enters and reverses the flow. Another procedure is the employment of an accessory line of physiologic saline which is first run through the system until the successful insertion of the needle in the vein is demonstrated; the donor's blood is then shunted in, either by means of a Y tube and pinch clamps or by a two-way stop cock. All of the methods mentioned so far are adapted to the administration of blood through a "closed" or nearly "closed" system. When an "open" method is employed, a single line of tubing is attached to a receptacle such as a Kelly bottle or a salvarsan tube. The saline may be poured into the flask and the infusion satisfactorily initiated, then the blood mixture may be added to the infusion.

In the administration of both fresh and preserved blood, a filter should always be employed to remove the particulate matter. Small shreds of fibrin and debris from the leukocytes which might plug the needle or serve as emboli are more numerous in preserved blood. When an open system of administration is used, the blood may be easily and adequately filtered through three or four thicknesses of sterile surgical (washed) gauze. Filtration in the closed system offers more difficulties since the limited filtration area frequently becomes completely occluded, and it becomes necessary to use more than one filter. It is hoped that more adequate filters will be soon commercially available.

The chief factor governing the rate of administration of the transfusion is the caliber of needle employed. For the adult recipient, a needle of 18, 19, or 20 gauge is usually used. The blood is usually delivered from a height of about three feet above the recipient's arm. With such a system and an 18-gauge needle, the maximum velocity possible is about 25 cc. per minute with citrated blood and about 36 cc. per minute with blood-dextrose-citrate. These velocities may be diminished by constriction of the tubing with a screw clamp. These, or faster rates, may be advisable in the treatment of shock; however, plasma is preferabe to blood in this instance. The average rate of administration of 4 to 8 cc. (60 to 120 drops) per minute should not ordinarily be exceeded.

The selection of a vein for the insertion of a needle is a matter of experience and further discussion is probably valueless. It goes without saying that the ability to enter a vein is the *sine qua non* of all transfusion procedures. Occasionally dissection and cannulation of the vessel may be necessary. Attention is called to the fact that injection in the femoral vein can usually be performed when all other veins are inaccessible because of anasarca, obesity, or extreme shock (1).

As has been mentioned previously the transfusion of

blood, plasma or other fluids may be made without preliminary warming. This is necessary when preserved blood is employed since it not only saves valuable time but the procedure of warming carries some potential danger.

The recipient should be attended during the transfusion, not only to regulate the apparatus but also to discontinue the transfusion at the first sign of a severe reaction of the urticarial, the hemolytic, or the circulatory type. This may be a life-saving precaution.

Transfusion reactions should be dealt with as indicated in another chapter. If circumstances permit, it is probably safer to examine the urine just prior to the transfusion and ascertain whether it is alkaline or acid in reaction. The result of such a test in the presence of cystitis is, of course, no indication as to the reaction of the urine as it comes from the kidneys. The urine may be alkalinized by the oral administration of sodium bicarbonate or sodium citrate. This usually takes several hours or longer. Sodium r-lactate may be similarly used intravenously with almost immediate effect.

The urine voided for 24 hours after the transfusion should be saved, and the volume output for this period should be recorded, since it might be the only indication that oliguria or anuria had developed in a patient who was otherwise very ill. The urine should also be tested for the presence of hemoglobin.

PART III. APPENDIX

Chapter XII. Preparation of Equipment for Intravenous Use

Up to the present time all intravenous equipment has depended on the availability of high-grade gum rubber tubing manufactured for the express purpose. This implies that the maker has taken precautions to eliminate soluble and insoluble substances which would be unsuitable for intravenous injection. This type of rubber must be regarded as perishable and certain facts should be recognized. The rubber deteriorates, particularly through oxidation. This process is accelerated by high temperatures and the presence of moisture. The reserve stock should be kept in a cool, dry place in the dark. It is advisable about once a month to stretch each piece several times by hand. Gum rubber deteriorates very rapidly with each autoclaving. Extensive experience with one make of latex rubber tubing has shown that it will stand about 15 sterilizations with steam heat before it is rendered unsuitable for intravenous use by loss of elasticity and increased cohesiveness. Another fact is noteworthy. When gum rubber is heated in the presence of moisture, it takes on a cloudy appearance which is due to combination with the water. This disappears when the rubber is thoroughly dried either in the autoclave or in the air. While this state exists, the rubber is extremely delicate and is much more susceptible to injury. The life of the tubing may be prolonged if care is taken to have it thoroughly dried before using. This may be accomplished by drying in the autoclave after sterilization or by allowing the sterilized packages to stand for several days before using. New tubing, unless expressly prepared at the factory, must be specially treated before use. See Appendix K in Manual on Citrated Normal Human Blood Plasma.

The elimination of pyrogens is perhaps the most difficult and the most poorly understood procedure in the preparation of equipment for intravenous use. Many species of water bacteria may grow for some hours in distilled water and produce soluble, ultrafilterable substances which cause chills and fever when injected intravenously into rabbits or into man. This property is not inactivated by the heat used in the sterilization of equipment. Pyrogens can be washed out of equipment by rinsing with pyrogen-free fluids. It is necessary, then, to have a source of pyrogen-free water with which to prepare equipment. This may be obtained commercially from the firms manufacturing fluids for intravenous use or it may be manufactured in the laboratory by the efficient distillation of water from the sources utilized for drinking water. A good, single still (a triple still is not necessary), if run at less than full capacity, will furnish pyrogen-free water. In this case, the presence of pyrogens should be tested for by the intravenous injection of water samples into rabbits and observing the body temperature over a few hours. For details, see the original papers of Seibert (42). After the equipment is mechanically and chemically clean, it is then rinsed with pyrogen-free water. *It should then be dried rapidly or wrapped and autoclaved before time has elapsed for bacteria to grow in the resulting moisture.* (Glassware may be dried in a laboratory or domestic oven. The rubber tubing may be dried by forcing dry, clean air through it.)

The mechanical removal of blood, serum, and dirt may be accomplished by forcing tap water (if low in pyrogens, otherwise use freshly distilled water) through the tubing and then washing with hot water containing a detergent such as trisodium phosphate. Coagulated protein may be forcibly removed from rubber tubing by inserting pipe cleaners which may be obtained from laboratory supply houses in 3-ft. lengths.

An outline of the procedures for the preparation of equipment for intravenous use is as follows:

1. Soak soiled equipment in cold water for some hours to remove some of the blood and plasma proteins.
2. Clean glassware and tubing mechanically with brushes and pipe cleaners, again using cold water.
3. Wash in warm tap water to which has been added detergent such as trisodium phosphate.
4. Rinse thoroughly with warm tap water. The alkaline trisodium phosphate clings to surfaces tenaciously and requires much washing to remove.
5. Rinse at least twice with pyrogen-free water.
6. Assemble intravenous equipment, package, and autoclave at once if wet, within a few hours if equipment has been dried before assembling.

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HOSPITAL ACTIVITIES

California

Class of 20 Graduates. The class of 1942 of Providence Hospital College of Nursing, Oakland, consists of 20 graduates. The nurses received their diplomas from Most Rev. Thomas A. Connolly, auxiliary bishop of San Francisco, at ceremonies held in the hospital chapel. In a congratulatory address the bishop reminded the graduates that in consecrating themselves to the service of God in their nursing profession they should always keep in mind the words of Christ: "For the Son of Man also is not come to be ministered unto, but to minister, and to give His life for the redemption of many."

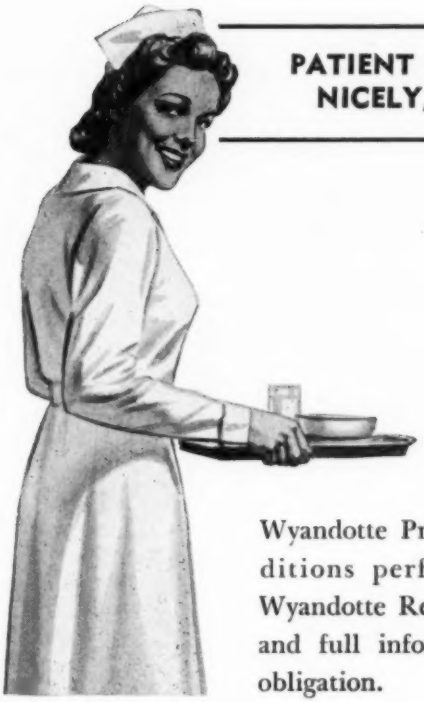
"Model your lives then on Christ," said His Excellency. "Remember His sympathetic attitude toward the poor, the maimed, the lepers, and all the afflicted. . . . Your vocation is elevated over that of any other in the spiritual order, outside of the religious vocation, in that your ministrations are not confined to bodily ills alone, but touch very closely on the spiritual life of those who come under your care. . . ."

The Bishop continued: "The way of the Cross is the royal road, and the path to paradise is to be found amid pain and suffering . . . and whether it be your lot to serve your fellow men in fields close at home or on some far distant battlefront, we shall all hope and pray that the divine guidance shall continue to attend you, giving you every grace and strength necessary to aid the suffering."

Rev. Gerald J. Geary, assistant pastor of St. Ambrose Church in Berkeley, delivered the commencement address in which he stressed the point that the Church regards the vocation of nursing as similar to the religious life. "This graduation," he said, "differs distinctly from that of any other group in that it is essentially a religious service, and is enacted in the presence of the Divine Physician. Dedicated to a life in the performance of the works of mercy, the Church feels that the vocation to nursing is in a very special way akin to the religious life. . . .

(Continued on page 20A)

PATIENT IS DOING VERY NICELY, THANK YOU



"I've worked in many institutions but never in one where dishes, glasses and silverware were as sparkling clean as they are here.

"Why? Because we not only use proper dishwashing products, but because we also know HOW to use them. We use Wyandotte Dishwashing Compounds and learned HOW to use them from a Wyandotte Representative."

* * *

You, too, can have clean dishes—free from stain, without film or smear. Your glasses can be clear and sparkling bright after washing and rinsing. Your silverware can shine. Little things like this mean a lot for patients, and to every one concerned.

For dishwashing by hand, by machine and for washing glasses and silverware there are Wyandotte Products to fit *your* conditions perfectly. Call on *your* Wyandotte Representative for details and full information. There is no obligation.

FIVE QUESTIONS

your Wyandotte Representative Can Answer

1. What is the proper method of pre-rinsing dishes to remove *all* excess food?
2. Which Wyandotte Product, and what strength of solution, do you recommend to fit local conditions?
3. What washing and rinsing temperatures should I maintain?
4. How long should dishes remain in the washing and rinsing solutions?
5. What recommendation do you make to improve my dishwashing procedure?

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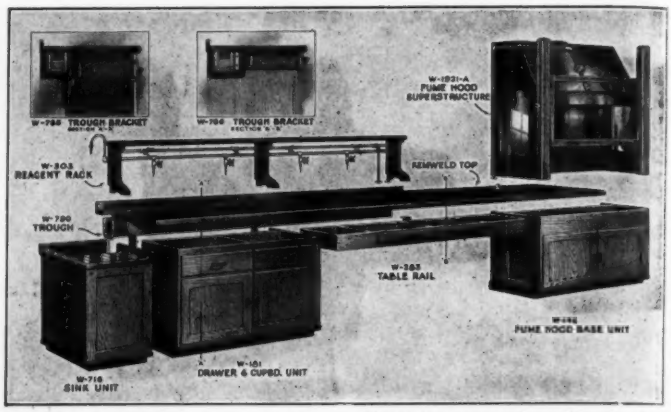
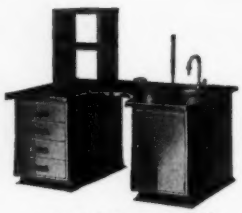
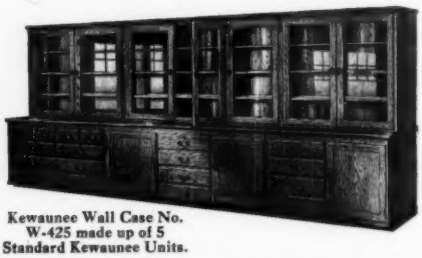


Illustration above shows how Standard Furniture Units are assembled by the Kewaunee "Cut-Cost System." This Kewaunee Laboratory Table No. W-2045 is made up of 10 Standard Kewaunee Units.

Kewaunee Automatic Adjustable Stools and Chairs with seats that lock instantly and automatically at "Heights that are right."



Private Laboratory Table



Kewaunee Wall Case No. W-425 made up of 5 Standard Kewaunee Units.

HOSPITAL ACTIVITIES

(Continued from page 18A)

"The spiritual motive which laid the foundation for the modern work of nursing, as exemplified in the life of Florence Nightingale, is directly traceable to the works of charity of the Catholic Sisters in France. In England religion had grown cold — an empty ritual — sick were neglected and the poor despised when Florence Nightingale found her inspiration in the work of the Sisters who conducted a hospital in Paris. She carried the ideal she had there acquired back to England and so gave a spiritual life to the nursing vocation in that country. It is this same spiritual motive of Christian charity that has been the inspiration of these graduates of today and which has sustained them during the hard years of training. . . .

"If the life of a nurse is so different from that of almost any other profession, if it requires a strict adherence to a rigid discipline, it stands to reason that it can be motivated only by an ideal that is spiritual; otherwise it is a meaningless thing indeed. . . . It may seem strange, but it is true, that in the profession of nursing its chief spiritual inspiration comes directly from the fortitude, courage, and patience displayed by the sick whom they attend, for, paradoxically, we often find that those who find it difficult to face the ordinary things of life, when they are finally laid on a bed of sickness give heroic examples of the virtues of fortitude and courage. . . .

"And now as you graduates go forth into the world to begin your individual careers, to apply the lessons and principles you have here acquired in your years of preparation, you will be successful in just that measure that the ideals of Christian charity motivate your work — in seeing in the people whom you serve the likeness of the suffering Christ."

(Continued on page 22A)

THE HOSPITAL OF SAN RAPHAEL, NEW HAVEN, CONN.

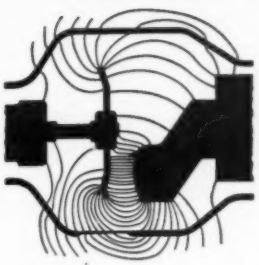
Streamlined "on the beam" Electrodes

ONE OF SEVEN BIG REASONS WHY THE CRT 1-2 ROTATING-ANODE X-RAY TUBE IS BETTER FOR YOU

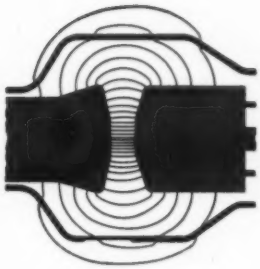
Streamlining the anode and cathode of the G-E Model CRT 1-2 tube offers you TWO definite benefits unavailable with electrodes of conventional shape.

1. Since electron bombardment follows no distinct path from cathode to target, a wide, all-tungsten anode face produces considerable off-focal spot radiation which reduces diagnostic quality in the radiograph. But, by streamlining an anode structure whose target is a ring of tungten mounted in copper, as with the CRT 1-2, off-focal spot radiation is greatly reduced.

2. Streamlining with the CRT 1-2 also minimizes contact of electric field lines of force with the tube's glass envelope. The high voltages at which rotating-anode tubes are operated would otherwise place a great stress on the glass, shorten tube life, and promote unstable operation. Streamlining the CRT 1-2's electrodes reduces this voltage stress, lengthens tube life, stabilizes operation, and permits rating the tube at 100 kvp without undue voltage stress.



Wide tungsten target's scattered electric field lines which produce stress on glass envelope, threatening tube puncture.



CRT 1-2 streamlined anode's more uniform electric field lines which reduce costly stress on glass envelope.

Six more reasons why the CRT 1-2 offers you much more for your x-ray tube dollar are: (1) Lubricated bearings; (2) massive copper anode; (3) oil-cooled cathode; (4) seasoned filament; (5) seasoned target; and (6) electric dynamic brake. A complete description of all these CRT 1-2 improvements is contained in a free, illustrated booklet which you may have by addressing Dept. K36, today.

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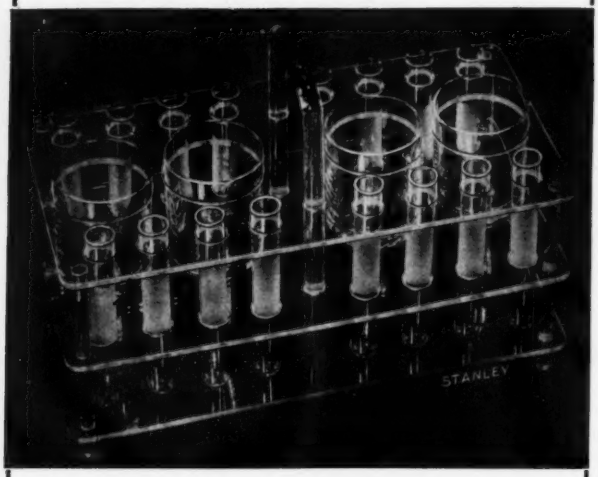

NECESSITY has been hailed the mother of invention. It certainly turned out a blessing when the Stanley Thermometer Rack *went plastic!* We thought it couldn't be improved, but plastic is far and away the better material. Glass tubes broke too easily against metal, but plastic "cushions" the shock, prevents easy breakage. It is not affected by antiseptic . . . is lightweight . . . takes all the normal abuse . . . and as for looks, wait till you see the new *plastic* Stanley Rack!

★

Of course, you know the advantages of the Rack . . . such as preventing cross infection, identifying patient's thermometer by writing name on tube's frosted patch. Each Rack has 4 glasses, holds 8, 12, 16 or 24 tubes. Modernize now with this new *plastic* Stanley Thermometer Rack!

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"Stanley For Professional Standards"

HOSPITAL ACTIVITIES

(Continued from page 20A)

Holds Spring Party. The annual spring card party of the Hospital Auxiliary of Providence Hospital, Oakland, was held in the auditorium of the College of Nursing on Hospital Day. Proceeds of this party will be used for the maintenance of the children's clinic, where hundreds of poor children are given free medical care through the voluntary services of the physicians and nurses of the hospital staff. The auxiliary also maintains some free beds and a prenatal clinic for financially dependent mothers.

The auxiliary has organized a Red Cross unit for members and friends, who meet every Wednesday, and on Friday it sponsors a group of volunteer workers who take care of the hospital linens.

Seniors Receive Diplomas. Thirty-five seniors of St. Joseph's Hospital College of Nursing, San Francisco, received their certificates of graduation from Most Rev. Thomas A. Connolly, auxiliary bishop of San Francisco, on a Sunday afternoon in St. Mary's Cathedral. Archbishop John J. Mitty presided and Rev. Brendan Mitchell, O.F.M., preached the festal sermon. Rev. Edgar Boyle, choir director, conducted the student nurses in singing. Four of the graduates are male nurses.

Teaching Nurses Needed. More women of San Jose desire to take Red Cross courses than there are nurses ready to teach them. This is the statement made by Mrs. W. W. Leggett, chairman of home nursing of the Nursing Activities Committee of the local Red Cross chapter, who has made an appeal for more nurses to assist in this work.

Illinois

Open House and Tea. The Little Company of Mary Hospital in Evergreen Park, Chicago, celebrated National Hospital Day with open house from 1 to 5 in the afternoon. Tours were conducted through the hospital by the Gray Ladies and nurses' aides. Later the Service Club served tea.

Annual Mass for Society. The annual high Mass for the members of the Hospital Aid Society of St. Mary's Hospital, Quincy, was celebrated on May 26 in the hospital chapel. Because the usual feast day for the celebration of this Mass, Our Lady Help of Christians, fell on Pentecost Sunday, the Mass was postponed. Rev. Odillo Eichenseer, O.F.M., of Holy Trinity Church in Dubuque, Iowa, was the celebrant.

Alexian Brothers' Hospital Day. The Woman's Auxiliary of the Alexian Brothers' Hospital, Chicago, sponsored a reception and tea in a celebration of Alexian Brothers' Hospital Day on Sunday, June 21. This hospital for men has, for many years, been a boon to sick men who find its accommodations ideal. All the nursing is done by Brothers and lay male nurses.

The boys' department has been accepted gratefully by the public. Even babies are admitted to this section.

The Alexian Brothers' Hospital, while serving as a model in up-to-date equipment, has always kept its rates within the means of patients of the middle class who appreciate the homelike atmosphere of the institution. Even the casual visitor senses the spirit of cordial welcome. A special feature of the building is the roomy chapel on the first floor which has a balcony for patients on each of the three upper floors.

Indiana

New Altar at Hospital. A beautifully designed altar has been donated to the Sisters of St. Joseph's Memorial Hospital, Kokomo, for their hospital chapel. The altar was designed by Mr. Herman Bir, an artist of Marion, and was given to the Sisters by Mr. Karl Johnson of Kokomo.

(Continued on page 23A)

HOSPITAL ACTIVITIES

(Continued from page 22A)

Kentucky

Hospital Graduates 21. Graduation exercises at St. Anthony's Hospital School of Nursing, Louisville, were held on Hospital Day. A solemn high Mass was offered for the intentions of the graduates in the hospital chapel by Rev. John Dudine. At three o'clock in the afternoon Archbishop Floersh conferred the diplomas at the commencement program, and Rev. Symphorian Weiner, O.F.M., and Rt. Rev. Msgr. Yokum addressed the graduates. In the evening the new graduates were guests of the alumnae.

Graduate on Hospital Day. In the afternoon of Hospital Day, in the chapel of SS. Mary and Elizabeth Hospital, Louisville, 21 seniors received their diplomas from the hospital chaplain, Rev. B. J. Wight. Rev. Charles Boldrick spoke in his commencement address on *Service,* urging the graduates to give their very best at this urgent time. The services closed with Benediction of the Blessed Sacrament.

Louisiana

Tag Sale for Hospital. In conjunction with the regular celebration for Hospital Day, St. Francis' Sanitarium in Monroe sponsored a tag sale for the benefit of its auxiliary ward. The sale was approved and promoted by Mayor Harvey H. Benoit, who urged the citizens of Monroe and vicinity "to assist in making a great success of this tag sale."

Maryland

Hospital Gets U. S. Fund. Mercy Hospital, Baltimore, has been allotted $262,000 by the United States Government for building an addition to care for the ever increasing number of patients it receives. The apportionment was made from funds provided in the Lanham Act and was announced to the hospital on May 14.

The present hospital, which has a bed capacity of 330 including bassinets, cared for 8182 patients during 1941 and averaged almost 100 births each month. When the supply of bassinets gave out recently, the hospital Sisters substituted bureau drawers. Last year, 8822 persons received first aid in the accident ward; the out-patients in the dispensary numbered 22,053 and the total out-patients numbered 34,254 The new unit will provide for 76 more beds. Because the shortage of bed provision has been a growing problem and because the influx of new residents into Baltimore has increased tremendously due to war industries, this additional hospital space is necessary.

Mercy Hospital is operated by the Sisters of Mercy and was taken over by them in 1872. Previous to this time it was operated by a group of physicians and surgeons who called it City Hospital. In 1909 the Sisters changed its name to Mercy Hospital. The hospital has been enlarged several times. In 1888 the main hospital was erected, and the present building was equipped with $20,000 raised at a fair at which the Marine Band played under Sousa. In 1911 an addition was built, and in 1919 a nurses' home was erected. In 1900 a department known as the Pasteur Department, the only one south of New York, was opened and remained at the hospital until 1924 when it was moved to the State Department of Health.

The Sisters of Mercy have had experience in the effects of war: During the Civil War members of the order nursed in a government hospital in Washington. During the period of the Spanish-American War, the Sisters at Mercy Hospital cared for wounded soldiers returning home. In the World War they served their country again, and many served as night nurses at Fort Meade; and during the influenza epidemic cots were placed in the corridors, including the first floor, for the excess number of patients.

(Continued on page 24A)

HANOVIA SAFE-T-AIRE
QUARTZ ULTRAVIOLET LAMPS
for the destruction of Micro-Organisms in the air.

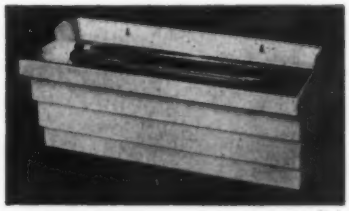
SCIENTIFIC research has shown the danger of infection by air borne bacteria. This source of infection has, in the past, been largely uncontrollable. Now, Safe-T-Aire Ultraviolet lamps have been shown to kill pathogenic micro-organisms floating in the air.

Hanovia Safe-T-Aire Lamps are now being used with great success in Operating Rooms, Milk Formula Rooms, Nurseries, Clinics, Isolation Wards, Corridors and everywhere where air sanitation is an important factor.

One eminent authority, following a series of successful experiments with ultraviolet rays in checking measles, epidemics in school rooms made this significant statement: "You can now have contagion-proof rooms in the same sense that we now have fireproof buildings."

We invite inquiries for complete details covering Hanovia's Ultraviolet Safe-T-Aire Lamps.

Floor Stand Model



Wall Bracket Model

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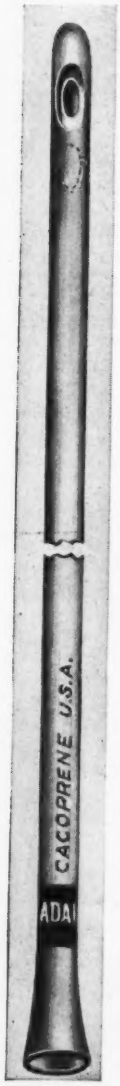
CATHETERS EARN THEIR STRIPES

. . . . they're in the NAVY now!



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The U. S. Navy Medical Department is now using large quantities of Robinson Catheters, made of Cacoprene. You know . . . that Cacoprene is synthetic rubber, a special formula of DuPont's NEOPRENE . . . that catheters made of Cacoprene cost more than regular rubber catheters . . . that the U. S. Navy is a very critical buyer, buying only after careful comparison of costs.

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IT IS IMPORTANT . . .

that at a time when natural rubber is one of the most critical of war materials, a synthetic rubber (Cacoprene) not only serves the purpose, but serves this particular purpose better than natural rubber. By using Cacoprene you will not only help conserve our supply of natural rubber, but you will benefit by the additional service Cacoprene affords.

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HOSPITAL ACTIVITIES

(Continued from page 23A)

Mercy Hospital School of Nursing recently graduated 44 seniors, and now there are 137 students in the underclasses. Since 1901, 986 nurses have been graduated. In order to expand its nursing education, the school received federal aid for the February class of 1942, and aid has been approved for the June class.

Michigan

Staff Edits Publication. Recently the first issue of *Staff News* was published by St. Mary's Hospital, Grand Rapids. Dr. Henry P. Kooistra is editor-in-chief and Dr. Martin Batts, Jr., is associate editor. The first number of this hospital publication contains news about the hospital and its personnel, original medical articles and digests, and a historical sketch of Mother Catherine McAuley, foundress of the Sisters of Mercy of the Union, which was written by Dr. William R. Vis.

National Council Meets. More than 1200 nurses took part in the first biennial convention of the National Council of Catholic Nurses, which was held in the Hotel Statler, Detroit, May 25 to 27. The convention was formally opened with the celebration of a pontifical Mass by Archbishop Edward Mooney in the Cathedral of the Blessed Sacrament. His Excellency, Most Rev. John F. Noll, bishop of Fort Wayne and episcopal chairman of the lay organizations of the National Catholic Welfare Conference, preached during the Mass on "Supernaturalizing Nursing Service."

The principal subject under discussion at this convention was "Problems of Nursing During Wartime." Miss Mary E. Kelly of Detroit, president of the national council, presided at the opening meeting. Mayor Edward J. Jeffries of Detroit gave the address of welcome, and Archbishop Mooney, Bishop Noll, and Rev. James J. O'Mara who is spiritual director of the Detroit Federation of Nurses, extended their greetings. The meeting on the first evening of the convention was presided over by Rev. James P. Logue of Pittsburgh, Pa., who is spiritual director of the national organization. Among the speakers were Miss Mabel E. Court-

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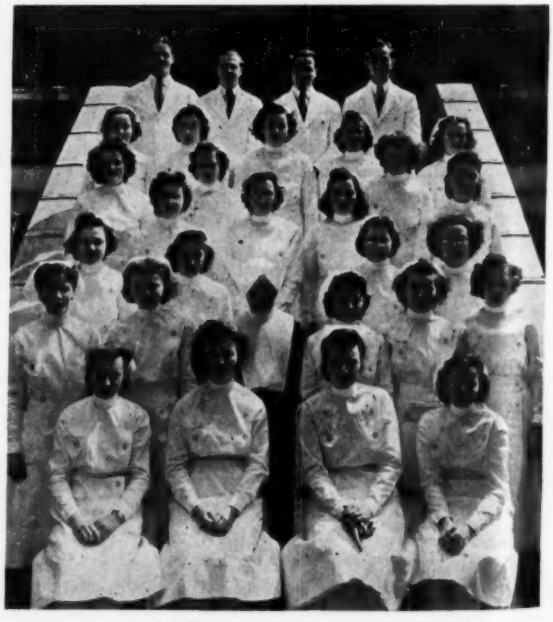

CLASS OF 1942, SCHOOL OF NURSING, ST. JOSEPH'S HOSPITAL, PHILADELPHIA, PA. FOUR MEN AND 25 WOMEN RECEIVED DIPLOMAS

Valuable DIAGNOSTIC AIDS

. . . Hematology
Urinalysis
Bacteriology

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For Sharper Diagnostic Roentgenography

MALLINCKRODT CONTRAST MEDIA

BARIUM SULFATE U. S. P. XI for X-ray Diagnosis —made by an exclusive Mallinckrodt precipitation process for utmost smoothness, excellent suspension, and freedom from injurious foreign substances.

HIPPURAN* N. N. R. (Sodium salt of ortho-iodohippuric acid)—Non-irritating and relatively non-toxic for pyelography, cystography and urography.

HIPPURAN* STERILE SOLUTION N.N.R. (12 grams of Hippuran* dissolved in 25 cc. distilled water.) Literature references as to recommended technic, indications and contraindications sent on request.

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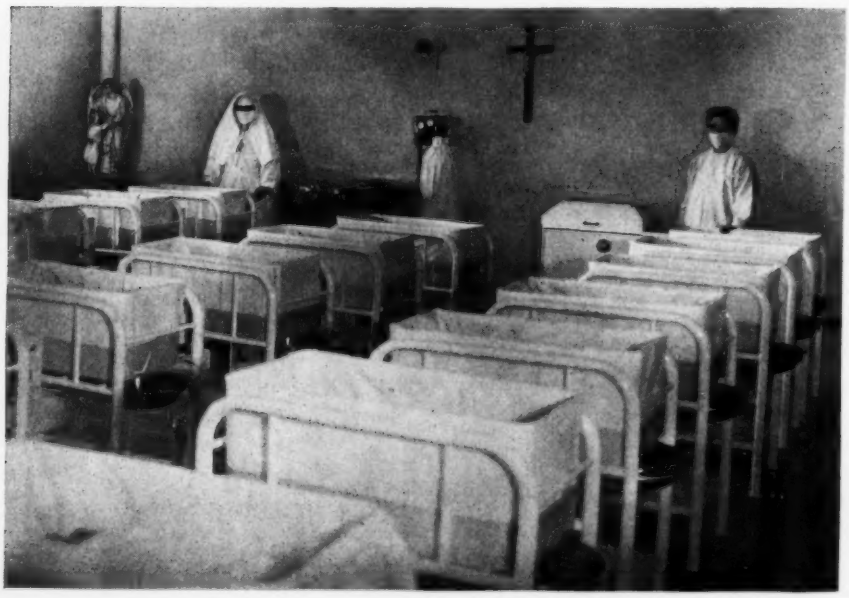
HOSPITAL ACTIVITIES

(Continued from page 24A)

ney, president of the Detroit Federation of Nurses; Miss Kelly; Miss Mary G. Hawks of Buffalo, a member of the executive committee of the National Catholic Community Service; Miss Grace Ross of Detroit, president of the National Organization for Public Health Nursing; and Col. Edmond J. Griffin of the United States Army.

The second day of the convention opened with a requiem high Mass for the deceased nurses of the organization; the Mass was celebrated in St. Aloysius' Church by Msgr. Edward J. Hickey. The morning session covered a discussion on "Organization of Diocesan and Local Units of the National Council of Catholic Nurses," and it was led by Miss Mary E. Gillen of Monroe, La.; Mrs. Margaret Fitzgerald of New York City; and Miss Estelle Mann of Los Angeles, Calif. In the afternoon Bishop Karl J. Alter of Toledo and Rev.

(Continued on page 28A)



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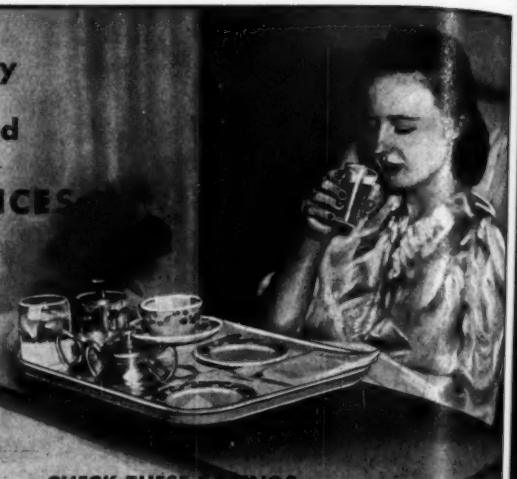

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HOSPITAL ACTIVITIES

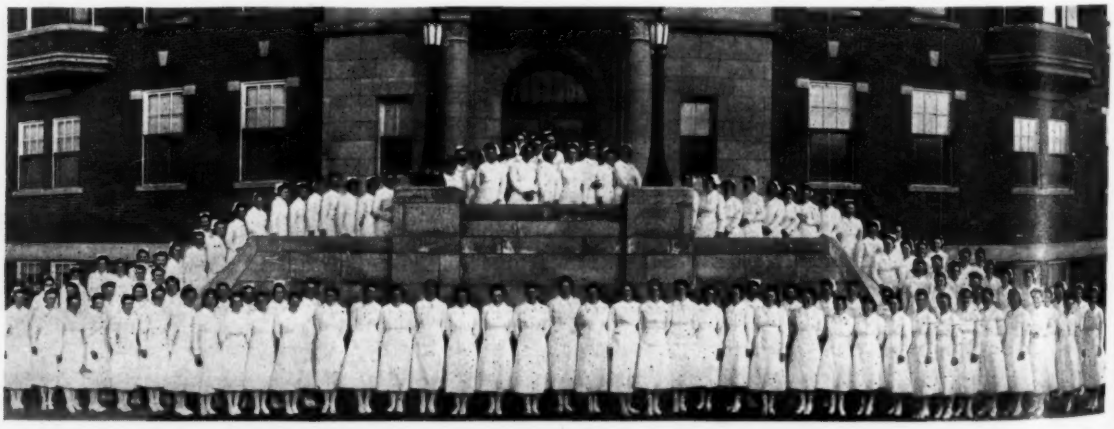
(Continued from page 26A)

Francis J. Connell, C.SS.R., of the Catholic University spoke on moral problems of nurses. Miss Ann V. Houck of Toledo, Ohio, presided. The convention banquet was held in the evening with Rev. Robert J. Maher of Lebanon, Pa., as toastmaster and Mrs. Dorothy Carlin of Cleveland as the principal speaker. Miss Kelly presided.

On the closing day of the convention Father Logue celebrated Mass in St. Aloysius' Church for the delegates and visitors. Following the Mass there was a special session for spiritual directors of nurses and a special session for Sisters. Bishop Noll presided at the priests' program and the speakers were Msgr. M. J. Gruenewald of Belleville, Ill.; Rev. John Barrett of Chicago; Rev. Robert A. Maher of Toledo; Rev. James W. Nagle of Cleveland; and Rev. Raymond O'Flaherty of Los Angeles. The Sisters' session was presided over by Sister Helen Jarrell of Chicago, a member of the Council on Nursing Education for the United States for the Catholic Hospital Association. The speakers were Sister Pauline of Detroit, Mother M. Rose of Pittsburgh, and Sister Beatrice St. Louis of Toledo.

The general session for the closing day was held at 10:30 a.m., at which Msgr. Michael J. Ready, secretary of the National Catholic Welfare Conference, was the principal speaker. He was introduced by Mrs. Mary Alice Seibert of Washington, D. C. Mr. Edgar A. Guest was the guest

(Continued on page 30A)



SCHOOL OF NURSING, 1941–42, ST. PAUL'S HOSPITAL, SASKATOON, SASK., CANADA

EVEN ON READY-TO-EAT CEREALS WE LEAVE NOTHING TO CHANCE—

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ERMA GREIG
B. S., Dietitian

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HOSPITAL ACTIVITIES

(Continued from page 28A)

speaker at the noon luncheon; he read some of his poems and also spoke to the delegates. Miss Gertrude Meyer of Baltimore presided at this luncheon meeting. The final business session was held at 2 p.m.

Seniors Receive Diplomas. Graduation exercises where held on May 28 at Nazareth College for the class of 31 seniors of St. Camillus School of Nursing, Borgess Hospital, in Kalamazoo. Bishop Joseph Albers of Lansing addressed the graduates.

One of the graduates, Miss Josephine Gibson, received the degree of bachelor of science from Nazareth College on June 8, after completing her five-year course.

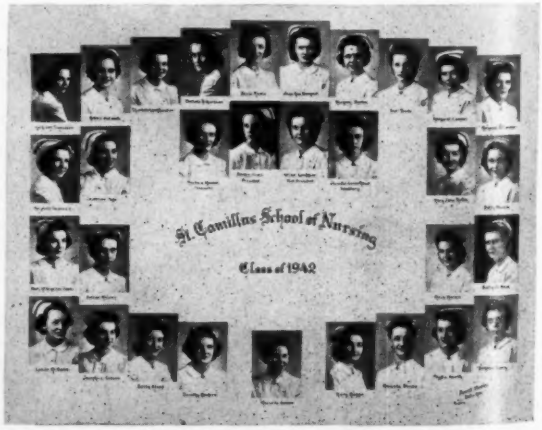
Minnesota

How Hospital Dollar Is Spent. Because there is still a disagreeable feeling in many people when they must pay money for hospital care, the Minnesota Hospital Association has made a report on how a typical dollar paid to a Minnesota hospital is spent. The figures, which refer to public and private hospitals that are members of the association, are as follows: administration, 8.2 per cent; housekeeping and laundry, 7.2; heat, light, and power, 7.2; maintenance and repairs, 4.1; nursing service and education, 17.5; pharmacy, 3.0; medical and surgical, 6.7; anesthesia, 1.2; X ray, 6.1; laboratory, 2.3; dietary department, 19.2; and depreciation, interest on mortgage, and miscellaneous expense, 17.3.

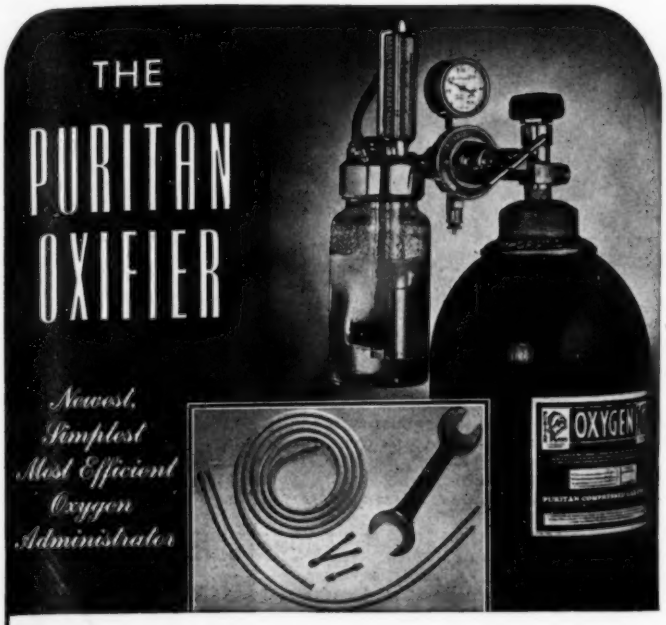
Two-hundred and fifteen hospitals belong to the Minnesota Hospital Association with a total of 30,381 beds in continual use. On the occasion of National Hospital Day the association prepared a leaflet which expressed the significance of a hospital. It read in part: "The strength of a nation lies in the health of its people. Everywhere, men and women realize that their most valued possession is good health. Today, any condition that threatens the well-being of one person becomes the vital concern of all. In the unceasing fight against sickness, disease, and injury, the modern hospital joins forces with all health agencies throughout the nation.

"Each hospital stands as a tribute to civilization—a civilization in which the people are interested not only in their own welfare but also in the welfare of their neighbors. Never before in its history has the hospital been able to give

(Continued on page 33A)



CLASS OF 1942, ST. CAMILLUS SCHOOL OF NURSING, BORGESS HOSPITAL, KALAMAZOO, MICH.



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PURITAN COMPRESSED GAS CORPORATION

"Puritan Maid" Anesthetic, Resuscitating Gases and Gas Therapy Equipment

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HOSPITAL ACTIVITIES

(Continued from page 30A)

better scientific care to the sick and the injured. As a result, its influence as a health center in the community has become extensive and far-reaching.

"The position attained by the hospitals of today has been made possible by centuries of experience and scientific discoveries accompanied by public enlightenment."

Graduation Exercises Held. Graduation exercises were held for 21 seniors of St. Cloud Hospital School of Nursing, St. Cloud, in the Cathedral of the Immaculate Conception in the evening of May 17. His Excellency, Bishop Joseph F. Busch of St. Cloud conferred the diplomas, and His Excellency, Coadjutor Bishop Peter Bartholome, addressed the graduates. The ceremony closed with Benediction of the Blessed Sacrament. The student nurses, under the direction of Sister Urban, director of music of the College of St. Bènedict, sang the Benediction hymns. The public was invited to the ceremony.

Awards 35 Diplomas. At its fortieth annual graduation exercises, St. Mary's Hospital School of Nursing, Minneapolis, awarded diplomas to 35 seniors. The speakers on this occasion were Very Rev. James H. Moynihan, rector of the College of St. Thomas, and Dr. William O'Brien, associate professor of pathology and preventive medicine at the University of Minnesota. The graduates were presented by Dr. John J. Litchfield and were awarded their diplomas by Father Moynihan. The program included vocal and piano numbers and selections played by the school orchestra.

Missouri

Ten Young Men Graduate. The Alexian Brothers' Hospital School of Nursing, St. Louis, graduated ten young men on May 31. Mr. Cecil Anderson of Wahoo, Neb., was the valedictorian. The graduates were addressed by Very Rev. Msgr. Mark K. Carroll, pastor of St. Louis (Old) Cathedral.

Montana

Second Annual "Baby Party." Members of the Hospital Association of St. Peter's Hospital, Helena, held their second annual "Baby Day Party" on Hospital Day. The group that attended represented young babies and grown people, up to the age of 31 years, who where born in this hospital. The first baby born in St. Peter's Hospital arrived on November 22, 1884, and since then more than 3000 babies have been born. The busiest year was 1936 when 202 babies, including five pairs of twins, were born.

St. John's Observes Hospital Day. Members of the Hospital Guild of St. John's Hospital, Helena, sponsored the program for Hospital Day at this institution. They conducted open house, a linen shower, and silver tea. The guild, a nonsectarian organization, was founded in 1937 to assist the Sisters of Charity of Leavenworth in operating the hospital.

The hospital is in its seventy-second year of service and is located on approximately the same site as the original log structure erected in 1870. A six-story brick- and-stone combination structure was erected in 1884. In 1935 this building was destroyed by an earthquake, and it was after that time that the present modern, four-story structure was built. Since 1939, the year when the new building was opened, the hospital has cared for 4052 patients, including 626 maternity cases. The Hospital Guild has purchased a great deal of equipment for the new hospital, including an iron lung for

(Continued on page 34A)

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EVERY
aseptic requirement

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Also, all impurities are removed from Germa-Medica. High-pressure filtration makes the emulsifying lather 100% pure..assuring *real* economy.

Furthermore, Germa-Medica counteracts hard water. Thus it prevents the minerals from harming tissue undergoing intense scrubbing.

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GERMA-MEDICA
AMERICA'S FAVORITE SURGICAL SOAP

HOSPITAL ACTIVITIES

(Continued from page 33A)

infants, a basal metabolism machine, a doctor's register, emergency lights for the operating rooms, kitchen equipment, and furnishings.

Nebraska

Nurses Present Play. The nurses of St. Joseph's Hospital School of Nursing, Alliance, celebrated National Hospital Day by presenting a three-act comedy, "Too Much Service." After the play they conducted a dance and had the soldiers of Fort Robinson as their honor guests. The ladies of the Hospital Guild served luncheon during the evening.

Coronation Ceremony. The members of the Sodality of St. Joseph's Hospital School of Nursing, Alliance, participated in a coronation ceremony in honor of our Blessed Mother on Sunday afternoon, May 17. Miss Mary Jane Neville, the sodalist elected to crown the statue of our Lady, and her attendants were dressed in long pastel gowns and short veils; they carried baskets of spring flowers. Miss Eileen Thompson, president of the Sodality, carried the Sodality banner. The student body, dressed in uniform, formed a guard of honor, headed by Miss Althea Samples, who carried the American flag. The procession mached through the garden paths to the outdoor altar of our Lady, where they placed a wreath of roses on the altar. The sodalists marched again into the hospital and through the halls to the chapel. There Miss Neville placed her crown of flowers on our Blessed Mother's head and each sodalist placed her flowers around our Lady's statue. A choir of nurses sang the coronation hymn. After the ceremony the Litany of the Blessed Virgin and novena prayers in honor of the Holy Ghost were recited and Benediction with the Blessed Sacrament was given. Rev. Paul Moser, hospital chaplain, officiated.

New York

Annual Corporate Nurses' Meeting. On May 24 the Catholic Nurses' Association of the Diocese of Brooklyn held its annual corporate Communion and breakfast meeting. Holy Mass was celebrated by Rt. Rev. Msgr. Edward P. Hoar, V.G., in St. Francis Xavier's Church, and 700 nurses who were present received Holy Communion. A breakfast meeting followed at the Columbus Club. The principal speakers at the meeting were Rev. Francis X. FitzGibbon, executive secretary of the Confraternity of Christian Doctrine, and Dr. William C. Meagher, president of the Kings County Medical Society. Rev. Thomas F. Ryan, moderator of the Brooklyn chapter, acted as toastmaster and Miss Dorothy Hearn, R.N., president of the diocesan organization, presided. Mrs. Jane Kelly, R.N., chairman, and her committee members arranged an entertaining program. Among the invited guests were Rev. Joseph F. Brophy, diocesan director of Catholic hospitals; the reverend moderators of the four chapters of the C.N.A.; the presidents of the Catholic doctors' and dentists' guilds; Miss Florence Hill, R.N., first president of the C.N.A.; and members of the Army and Navy nursing corps.

260 Alumnae Meet. On the past Mother's Day 260 alumnae members of St. Catherine's Hospital School of Nursing, Brooklyn, came together at a Communion Mass and breakfast meeting. The group included lay nurses and Sister nurses, who represented nine different religious communities (three branches of the Order of St. Francis, Daughters of the Im-

(Continued on page 38A)

NEW! SINGLE PEDESTAL OVER-BED TABLE

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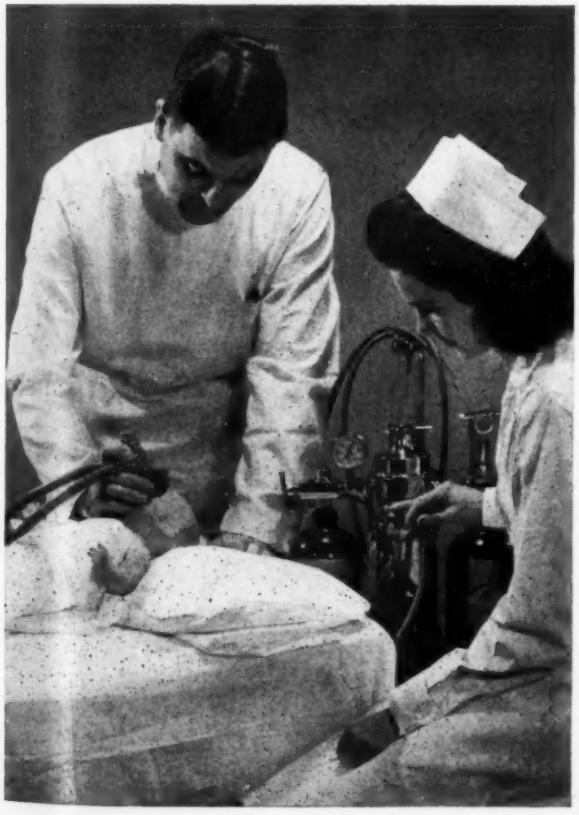

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HOSPITAL INDUSTRIES ASSOCIATION

★★★ ★★★

Twenty-Fifth Anniversary

A grain of mustard seed that has grown into a sturdy plant, could rightly be said of St. Joseph's Hospital, Beauceville, Que., Canada, on Sunday, May 31, at the celebration of the twenty-fifth anniversary of its foundation. Born out of the self-denial of generous hearts, the humble hospital has developed into a fair-sized institution. St. Joseph's was founded in 1917 by the Sisters of Charity of Quebec. It is a general hospital with a capacity of 50 beds. During the year 1941 there were 728 patients admitted and 395 surgical operations were performed.

The anniversary day opened with a solemn high Mass at 8:30, celebrated by Rev. Emery Pepin, pastor of St. Francis' Church. In his sermon, Father Pepin spoke of the great feast of the Blessed Trinity and the hospital anniversary, both of which fell on the same day. We must thank God, he said, for having given so many graces to this institution. Twenty-five years of toil, of devotedness, of generosity, there has been much of this for those — and they are numerous — who have come here. The Sisters are replaced in time but the hospital remains, always ready to give a greater and greater service.

At noon, the guests and the hospital personnel, as well as the able patients and old people, gathered around the same table set up in the main corridor of the hospital, for the anniversary banquet. Addresses were given by the chaplain, Rev. Thomas Cloutier, who presided at the gathering, Father Pepin, Rev. Pierre Veilleux, Rev. Eugene Dumas, principal of the Normal School and Academy, and Rev. H. Boulet, vicar. All of them praised the Sisters for their untiring devotion. Afterward, the Sisters held open house at the hospital, and at four o'clock Benediction with the Blessed Sacrament was given by the chaplain.

On Monday morning a requiem Mass was celebrated for the repose of the soul of the founder of the hospital, Father Lambert, and for the souls of all the deceased benefactors.

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ADMINISTRATORS who must purchase room furniture in today's market can depend on this—the cost of Eichenlaubs *better* wood furniture can be fitted into *any* hospital budget, and the service it gives will exceed *any* hospital's requirements. By purchasing it now, you immediately gain the benefits of finer furniture—prestige, luxuriousness, comfort, quietness, beauty. You also cut your maintenance costs to a minimum, effecting yearly savings that further reduce the economical purchase price. Send for our new illustrated catalog.

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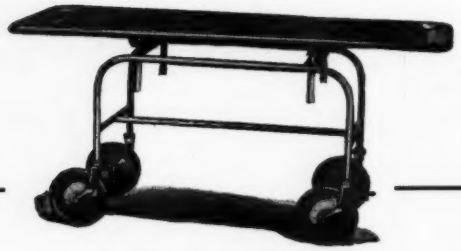
SISTERS OF CHARITY OF QUEBEC WHO WERE PRESENT AT THE TWENTY-FIFTH ANNIVERSARY OF ST. JOSEPH'S HOSPITAL, BEAUCEVILLE, QUE., CANADA. IN THE FIRST ROW (LEFT TO RIGHT) ARE: SISTER STE. MALO, FOUNDRESS; SISTER STE. JEANNE-DE-LA-CROIX, SUPERIOR OF ST. JOSEPH'S HOSPITAL; MOTHER STE. APOLLINE, FOUNDRESS AND FIRST SUPERIOR; MOTHER STE. HELOISE, PROVINCIAL SUPERIOR; SISTER MARIE-DE-LA-GARDE, FORMER SUPERIOR; SISTER MARIE DE TOUTES GRACES, ASSISTANT PROVINCIAL; AND SISTER STE. THEOPHILE, FORMER SUPERIOR



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HOSPITAL ACTIVITIES

(Continued from page 34A)

maculate Conception, Sisters of the Infant Jesus — Nursing Sisters of the Sick Poor, Sisters of Our Lady of Mercy from South Carolina, Marianites of Holy Cross, a Dominican from Sparkhill, and Diocesan Dominicans). The class of 1942, consisting of 32 lay students and nine religious, who represent five communities, were the honor guests. Another group to receive special recogniton were the members of the class of 1917, the silver jubilarians.

Rev. Martin Wenzel, hospital chaplain, was the toastmaster and Mr. Cornelius Barry, member of the speakers' club of St. John's University, was the guest speaker. Father Wenzel announced on this occasion that Rev. Paul J. Faustmann had been assigned the pastorate of Our Lady of Perpetual Help Parish in Lindenhurst, after being associated with St. Catherine's School of Nursing for the past 16 years.

Medical Mission News. The Catholic Medical Mission Board of New York City is desirous of having more units added to their Blue Cross Circle. Rev. Edward F. Garesché, S.J., president and director of the board, organized this project some years ago when he reflected that zealous groups of Catholic women and girls in societies, colleges, and schools could be grouped into circles under the patronage of our Blessed Mother, Health of the Sick. The Blue Cross Circle does work similar to that of the Red Cross Society, but with a supernatural motive and for the help of the missions at home and abroad and under the patronage of our Blessed Mother. Any questions about the work may be sent to the Catholic Medical Mission Board, 8 and 10 West 17th Street, New York City.

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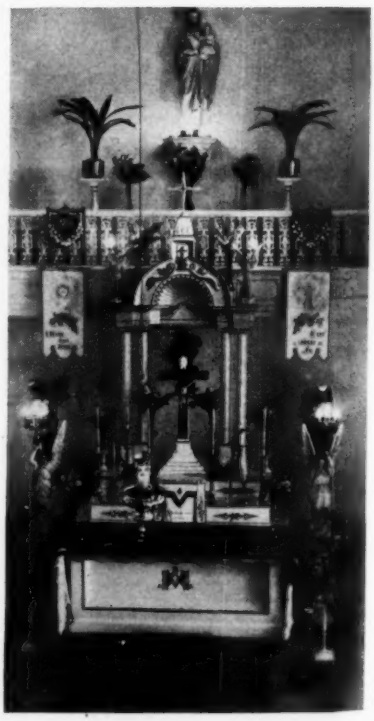

ALTAR IN THE CHAPEL, ST. JOSEPH'S HOSPITAL, BEAUCEVILLE, QUEBEC

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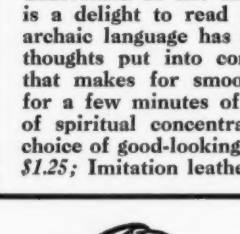

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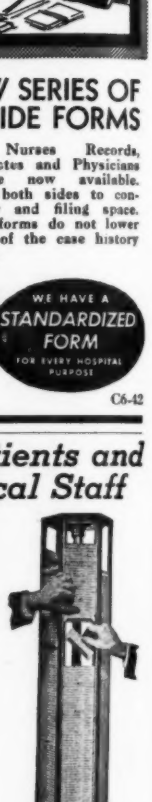

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HOSPITAL ACTIVITIES

(Continued from page 38A)

Canada

Carrying On at St. Paul's Hospital. During this war period, St. Paul's Hospital in Saskatoon, Sask., reports that its bed capacity of 250 has been well filled and is especially caring for goiter, gall bladder, cancer, and heart disease patients. Saskatoon is a city of 40,000 people and has one other hospital, which has 350 beds.

Cancer and heart ailments occur in large numbers everywhere and therefore are not peculiar to this vicinity, while goiters are prevalent here perhaps because of the inland location. Few deaths, however, result from thyroidectomies. The prevalence of cholecystitis among certain Russian sects who have settled on surrounding prairies has increased the percentage of gall bladder diseases.

The daily routine of this hospital has changed little since the war. Although several younger medical men have gone into service, no shortage has been felt because there was an oversupply of them during peacetime. They do report a shortage of interns. Instead of six, they have only two. This condition is being remedied, however, by a prominent local physician who conducts a course in "clinical assistantship." This course prepares specially selected and skillful registered nurses of the hospital's alumnae to replace interns in taking case histories, making physical examinations, and administering intravenous infusions. After careful teaching and supervision the nurses are approved by the medical staff. At present the hospital has only one of these advanced registered nurses in its employ.

St. Paul's School of Nursing is affiliated with the University of Saskatchewan for the five-year course leading to the bachelor of science degree in nursing. The ethics and psychology instructors are professors of St. Thomas More College, which is connected with the university. The number of nurses and students has been sufficient to take care of the nursing personnel. The domestic help is more difficult to retain because many girls are entering the air force. Now, however, the hospital is keeping their interest through a special course offered to them. The girls also have been given a recreation room.

St. Paul's Hospital has been filled with patients during the past year. The obstetrical department has been more active than usual, and the isolation unit has been used exclusively, especially for mumps and scarlet fever cases, for soldiers, sailors, and airmen.

Thirty Graduate. Twenty-nine young ladies and one man were graduated recently from St. Paul's Hospital School of Nursing, Saskatoon, Sask.

Hospital Day Observed. National Hospital Day was observed at Hotel-Dieu Hospital, Chatham, N. B. Many visitors came from surrounding districts, including more than 100 children and babies who were born in this hospital. The Sisters report that more than 90 per cent of these little citizens are either normal or overweight. The Marven Biscuit Co., of Moncton, N. B., provided an attractive lunch counter. The Sister superintendent and other Sisters and the members of the Ladies' Aid welcomed the visitors. The ladies served lunch. At the close of open house at four o'clock, the visitors went to St. Michael's parish auditorium for motion pictures showing first-aid workers in action.

Honored at Graduation. This year, for the first time since Hotel-Dieu Hospital School of Nursing in Chatham, N. B., received university status, St. Thomas College conferred the degree of bachelor of science in nursing on one of the school of nursing graduates. The recipient was Sister Frances Sanford, R.N., superintendent of the hospital. She had taken the first part of her course at St. Francis Xavier University

(Concluded on page 42A)

"The Patient is Doing Nicely, Thank You.."

● Roles have changed. Today many hospitals need "institutional hospitalization" for themselves, for the treatment of war jitters. Reduced personnel, mounting costs, and the difficulties of obtaining needed hospital supplies and equipment are just a few of the contributing factors that help build up a case for the hospital against itself.

But by and large, "the patient is doing nicely, thank you"... and major problems are met as they occur. Every new complication in the manufacture and availability of supplies and equipment in which "critical materials" are used, has a logical solution somewhere. It's part of our job to *find* and *apply* the right answers to these never-ending problems. It's part of our function to keep you posted as to just what items are *available*... and to do our super-best to see to it that your needs are properly met. But our biggest job is to *hunt down* and *nail down* every available item of hospital supplies and equipment ... in *original* or *alternative* form ... on a basis of special suitability for hospital service.

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HOSPITAL ACTIVITIES

(Concluded from page 41A)

in Antigonish and changed to St. Thomas College when Hotel-Dieu School of Nursing became affiliated with it.

On June 3 five lay seniors and two Sisters received their certificates of graduation. Dr. H. G. Vaughan, D.D.S., gave the opening address. Rev. John F. Ryan, former chaplain of the hospital and spiritual director of the school of nursing, was the principal speaker. He stressed in particular the life of self-sacrifice and Christlike charity which should be the distinctive traits of the nursing profession. Especially in these days of disaster and destruction will the nurse find her true sphere of activity. She must wisely guard herself against the false philosophies and the pagan values of human life, so rampant in our day.

In speaking of the nurse's ideal that should animate the hearts of the graduates, Father Ryan said "that ideal cannot be found in the excellence of technique, it cannot be found in the depth of your knowledge — though this be indispensable — nor can it be found in any other material reward given to the nurse's service. Something more is required and that something is *love*, for love is the foundation of service, and for you it must be the supreme ideal. The love that must inspire the true nurse is not of earth, it is of heaven. It is the love of the Sacred Heart, whence the profession of nursing sprang. It is that high, noble, persuasive, strength-imparting love of the Divine Physician who consecrated this honorable profession by His command and His example."

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